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UNIVERSITY OF CALIFORNIA.

BIENNIAL REPORT

OF THE

PRESIDENT OF THE UNIVERSITY

ON BEHALF OF THE BOARD OF REGENTS,

TO

His Excellency the Governor of the State.

1886.

SACRAMENTO:
STATE OFFICE.........JAMES J. AYERS, SUPT. STATE PRINTING.
1886.

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University of California, Berkeley, September 7, 1886.

To his Excellency the Governor of California:

Sir: The *Political Code* of California requires the Regents of the University to make a report to the Governor of California to be submitted before October first in each of the years 1880–82–84–86–88, etc.

The nature of the report contemplated is described in the *Organic Act* creating the University (see *Regents' Manual*, Article LIII, page 39), as follows:

> At the close of each fiscal year the Regents, through their *President, shall make a report in detail to the Governor, exhibiting the progress, condition and wants of each of the colleges embraced in the University, the course of study in each, the number of professors and students, the amount of receipts and disbursements, together with the nature, cost and results of all important investigations and experiments and such other information as they may deem important.

In accordance with law, the Regents of the University of California have caused the following report to be prepared by the President of the University, and to be transmitted to you for your information.

Very respectfully, your obedient servant,

EDWARD S. HOLDEN,
President.

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* For "*their* President" it is plain that we should read "the President of the University," or else we should have the anomaly of the Governor, as President of the Board of Regents, submitting a report to himself as Chief Executive.

REPORT PREPARED BY THE PRESIDENT OF THE UNIVERSITY ON BEHALF OF THE REGENTS.

University of California, Berkeley, June 30, 1886.

The information required to be submitted to the Governor by Article 53 of the *Organic Act*, covers the whole field of education in California. The *progress*, *condition and wants* of the University have vital relations with the condition of the Primary, Grammar and High Schools throughout the State (which prepare our candidates for admission) as well as with the various colleges of the University proper. Indeed, the progress, condition and wants of the University can only be adequately treated in connection with the progress, condition and wants of society throughout California itself.

I have been in office for too short a time to give in this report anything like an adequate review, and I have been obliged to confine myself to presenting here a mere bird's-eye view of the University, which I hope will not be without its value. I shall be obliged to speak of the University in some of its external relations, and I shall endeavor to be accurate in what I say. I am perfectly conscious, however, that the time I have been in office is quite too brief for anything more serious than the study which I now present, and I beg indulgence for shortcomings, of which I am entirely aware, but which I cannot now correct. Here is probably the best place for me to say that it is my firm conviction that no public officer of the State can be of more value to it, during the generation which is to come, than the President of its University. If this high office is held by a suitable man, and if he is supported, as he will undoubtedly be, by the intelligence and moral sense of the State, the amount of good which can be accomplished through efforts directed by him is simply incalculable.

There is no scholar in the public schools, from the primary through all the colleges of the University, who is not directly affected by the action of the University. The pupils of private schools and of sister colleges are hardly less affected. The tone of society throughout the State itself, and on the whole of the Pacific Coast, must inevitably be moulded by the beliefs and actions of our professors and graduates to a very important degree.

ORGANIZATION AND GOVERNMENT.

The University of California is an integral part of the public educational system of the State. As such it aims to complete the work begun in the other public schools. Through aid from the State and the United States, and by private gifts, it furnishes facilities for instruction in Science, Literature, and the professions of Law, Medicine, Dentistry, and Pharmacy. In the Colleges at Berkeley, namely, those of Letters, Agriculture, Mining, Mechanics, Civil Engineering, and Chemistry, in the Literary Course, and in the Course in Letters and Political Science, these privileges are offered without charge of tuition to all persons qualified for admission. The Professional Colleges in San Francisco are self-sustaining, and require moderate tuition fees. All courses are open to all persons without distinction of sex. The Constitution of the State provides for the perpetuation of the University with its existing departments of instruction.

ORGANIZATION.

The departments of instruction comprise the following:

I. In Berkeley.

1. The College of Letters:
   (*a*) Classical Course,
   (*b*) Literary Course,
   (*c*) Course in Letters and Political Science.
2. The College of Agriculture.
3. The College of Mechanics.
4. The College of Mining.
5. The College of Civil Engineering.
6. The College of Chemistry.

II. In San Francisco.

1. The Hastings College of the Law.
2. The Toland College of Medicine.
3. The College of Dentistry.
4. The California College of Pharmacy.

III. In Santa Clara County.

There will soon be added in Santa Clara County:
1. The Lick Astronomical Department (Lick Observatory).

HISTORY.

The University was instituted by a law which received the approval of the Governor March 23, 1868. Instruction was begun in Oakland in the autumn of 1869. The commencement exercises of 1873 were held at Berkeley, July sixteenth, when the University was formally transferred to its permanent home. Instruction began at Berkeley in the autumn of 1873.

The College of California, which had been organized several years before the University, transferred its property and students upon terms which were mutually agreed upon, and closed its work of instruction in 1869. This college was incorporated in 1855, and through its agency a part of the Oakland property of the University and the Berkeley site now owned and occupied by the latter, were secured.

The site of the University at Berkeley is a domain of about two hundred acres situated on the slope of the Contra Costa hills, about five miles from Oakland, facing the Golden Gate. It is traversed by two watercourses, is much diversified in aspect, and is adapted to a great variety of culture. A part of the grounds is reserved to illustrate the work of agriculture and horticulture, and is now under cultivation.

The undergraduate colleges were the only ones which had an actual existence in the original organization, although the *Organic Act* provided for the establishment of Colleges of Law and Medicine at Berkeley; the professional colleges in San Francisco have been added from time to time.

ADMINISTRATION.

The University of California is a State institution, established by the Legislature in accordance with the Constitution, and intrusted to the care of a corporation—the Board of Regents—which includes the Governor, the Lieutenant-Governor, the Speaker of the Assembly, the State Superintendent of Public Instruction, the President of the State Agricultural Society, the President of the Mechanics' Institute of San Francisco, the President of the University, and sixteen other Regents appointed by the Governor and approved by the Senate.

To this corporation the State has committed the administration of the University, including the finances, care of property, appointment of teachers, and determination of the interior organization in all particulars not already determined by law.

The instruction and government of the students of each college are intrusted to the Faculty of that college. The Academic Senate consists of the Faculties and Instructors of the University. It holds regular meetings twice a year, and is the governing body of the University proper in all matters of University concern which are expressly delegated to it by the Regents or by law. In all other matters the Board of Regents governs directly, or through the President or Secretary.

FUNDS.

The funds from which the University is maintained are derived from various sources, and include the following endowments:

1. The Seminary Fund and Public Building Fund, granted to the State by Congress.
2. The property received from the College of California, including the site at Berkeley.
3. The fund derived from the congressional land grant of July 2, 1862.
4. The Tide Land Fund, appropriated by the State.
5. Specific appropriations by the Legislature, for buildings, current expenses, etc.
6. The gifts of individuals.

The general funds of the University are devoted to the College of Letters and the Colleges of Science. The Colleges of Medicine, Dentistry, and Pharmacy are self-supporting. The College of Law has a separate endowment.

LEGAL STATUS OF THE UNIVERSITY.

Without going into the details of early legislation upon the subject of a State University, I will recite the provisions of Article IX of the Constitutions of California of 1849 and 1862.

Article IX of the Constitutions of California of 1849 and 1862 prescribed in its Section 4 as follows:

> The Legislature shall take measures for the protection, improvement, or other disposition of such lands as have been or may hereafter be restored or granted by the United States, or any person or persons, to this State, for the use of a University, and the funds accruing from the rents or sale of such lands, or from any other source, for the purpose aforesaid, shall be and remain a permanent fund, the interest of which shall be applied to the support of said University, with such branches as the public convenience may demand, for the promotion of literature, the arts and sciences, as may be authorized by the terms of such grant; and it shall be the duty of the Legislature, as soon as may be, to provide effectual means for the improvement and permanent security of the funds of said University.

Under the authority and provisions of this article of the Constitution of 1849 and 1862, certain statutes of California were adopted, which are given in the *Regents' Manual*, pages 24, 25. Under this provision of the Constitution, and under these specific Acts, any State University must have existed from 1849 up to the year 1868, when the present University was founded.

In the Statutes of California, 1867–8, page 248, is found an "Act to create and organize the University of California." This Act was approved March 23, 1868. It will be referred to here as the *Organic Act;* it is given in the *Regents' Manual*, pages 29 to 42 inclusive.

The *Regents' Manual*, pages 42 to 48 inclusive, contains certain Acts passed between the date of the *Organic Act* and March 26, 1872, providing for the support of the University, and for certain changes in its organization, etc. The *Organic Act* was amended subsequent to its passage—once, namely, in 1872—and this amendment is given in the *Regents' Manual*, page 48.

The *Political Code* of California was adopted March 12, 1872, and went into effect January 1, 1873. Between the date of the passage of the *Organic Act*, namely, March 23, 1868, and January 1, 1873, there is no question that the University was governed by the provisions of the *Organic Act*, of the Acts amendatory thereof, and by none others.

The *Political Code* of California went into effect, as I have said, on January 1, 1873. In the *Political Code* every provision of the *Organic Act* is again repeated in the same or nearly equivalent words. Some alterations are made by the *Political Code*, which, whether they are technically amendments to the *Organic Act* or not, do, in fact, change its provisions.

The *Political Code* contains a section as follows:

> No statute law or rule is continued in force because it is consistent with the provisions of this Code on the same subject; but *in all cases provided for by this Code, all statutes, laws, and rules heretofore in force in this State, whether consistent or not with the provisions of this Code, unless expressly continued in force by it, are repealed and abrogated.* This repeal or abrogation does not revive any former law heretofore repealed, nor does it affect any right already existing or accrued, or any action or proceeding already taken, except as in this Code provided, nor does it affect any private statute not expressly repealed.—[Political Code, Section 18.

On January 2, 1873, after the *Political Code* was in effect, it is clear that the *Organic Act* was abrogated. The *Code* provided for all cases arising in the University, and the *Organic Act*, which had been previously in force in the State, and which was not "expressly continued in force" by the *Political Code*, although it was in general consistent with it, was consequently repealed and abrogated by Section 18 above quoted. Hence, at this time, it appears to be clear that the *Political Code* was the only rule of government of the University, and it continued to be such until the new Constitution of 1879 went into effect, on July 4, 1879. The Constitution of California of 1879, Article IX, Section 9, provides as follows:

> The University of California shall constitute a public trust, and its *organization* and *government* shall be perpetually continued in the form and character prescribed by the *Organic Act* creating the same, passed March 23, 1868 (and the several Acts amendatory thereof), subject only to such legislative control as may be necessary to insure compliance with the terms of its endowment, and the proper investment and security of its funds.
>
> It shall be entirely independent of all political and sectarian influence, and kept free therefrom, in the appointment of its Regents, and in the administration of its affairs; *provided*, that all the moneys derived from the sale of public lands donated to this State by Act of Congress, approved July 2, 1862, and the several Acts amendatory thereof, shall be invested as provided by said Acts of Congress, and the interests of said moneys shall be inviolably appropriated to the endowment, support, and maintenance of at least one College of Agriculture, where the leading objects shall be (without excluding other scientific and classical studies, and including military tactics) to teach such branches of learning as are related to practical agriculture and the mechanic arts, in accordance with the requirements and conditions of said Acts of Congress; and the Legislature shall provide that, if through neglect, misappropriation, or any other contingency, any portion of the funds so set apart shall be diminished or lost, the State shall replace such portion so lost or misappropriated, so that the principal thereof shall remain forever undiminished. No person shall be debarred from admission to any of the collegiate departments of the University on account of sex.

It will be observed that the Constitution of California now in force, namely, that of 1879, expressly provides that the University of California shall constitute a public trust, and that its ORGANIZATION and GOVERNMENT (only) shall be perpetually continued in the form and character prescribed by the *Organic Act* creating the same, passed March 23, 1868, and the several Acts amendatory thereof, subject only to such legislative control as may be necessary to insure compliance with the terms of its endowment, and the proper investment and security of its funds.

The question arises: Under what law did the University exist on the day subsequent to the adoption of the Constitution of 1879? On the day *before* that adoption, it was undoubtedly governed by the provisions of the *Political Code*, and by those provisions only, the *Organic Act* having been replaced by the *Political Code* on January 1, 1873. On the day *after* the adoption of the new Constitution, it was governed, as far as its *organization* and its *government* were concerned, by the *Organic Act* creating the same, and by the Acts amending this *Organic Act;* but in all matters not relating to its organization, or to its government, it was undoubtedly still ruled by the provisions of the *Political Code.* Therefore, it is evident that at the present time, if any question arises with regard to the construction of the law relating to the University of California, the first thing to determine is whether this question relates to its *organization*, or to its *government.* If the matter in question is not a matter of organization, and not a matter of government, there seems to be no doubt that the University is to be ruled by the provisions of the *Political Code*, and by those alone.

If, however, the matter in question does refer to the organization, or to the government of the University, then the words of the Constitution of California plainly indicate that the *Organic Act*, and the Acts amending the *Organic Act*, are to govern in this matter, and not the *Political Code;* unless, indeed, the *Political Code* itself is an Act amending the *Organic Act*, and I think the views above presented show that it was so. The *Political Code* codified the provisions of the *Organic Act* and certainly amended them in various ways. In some particulars the provisions of the *Organic Act* were materially altered by the corresponding provisions of the *Political Code.* For this reason, it would appear that the *Political Code* is properly to be considered as an amendment to the *Organic Act*, and hence, as a portion of the law governing the University, even in matters of its *organization* and *government.*

From	To	The University was Governed by the Provisions of
--------------------	March 23, 1868------	Art. IX, Constitution of California of 1849 and of 1862.
March 23, 1868 -----	December 31, 1872 -	The Organic Act and its amendments.
January 1, 1873-----	July 4, 1879--------	The Political Code.
July 4, 1879 --------	The present time--	*A.* In all matters relating to the organization and government: by the Organic Act and the Acts amendatory thereof. *B.* In all matters *not* relating to the organization and government: by the Political Code alone.

NOTE TO A.—The Political Code amends the Organic Act in nearly every specific provision; it therefore takes its place. Practically we may say that from July 4, 1879, up to now, the provisions of the Political Code *alone* govern the University.

If this is not a correct view, it would appear to be imperative that the Board of Regents should at once examine the *Organic Act* and lay down explicitly just what portions of it relate to the organization and government of the University (and are therefore still in force), and what portions are not so related (and hence are repealed and abrogated).

It appears to me to be evident, whether we consider the *Political Code* to be technically an amendment to the *Organic Act*, or whether, for the sake of argument, we consider that the *Political Code* is not an amendment to the *Organic Act* in any sense, but simply one of the Acts in the minds of the framers of the Constitution of 1879, when they inserted the clause, "and the Acts amendatory thereof," in its Art. IX, Sec. 9; that it is still the governing law of the University in all matters relating even to the organization and the government of the University, as it undoubtedly is in all matters which do *not* relate to the organization and government.

It may, therefore, be safely said that the University of California is ruled at the present time by the provisions of the *Political Code*, and by those alone. If this view be adopted by the Board of Regents, no ambiguities in interpreting our legal status can arise in the future, as we shall have one law, and but one, to obey.

CHANGES IN THE TEACHING STAFF DURING THE TWO YEARS 1884-5 AND 1885-6.

[Given in order of date of occurrence.]

GEORGE H. HOWISON, A.M., LL.D., appointed to be Mills Professor of Intellectual and Moral Philosophy and Civil Polity, December 19, 1883. Assumed his duties June 1, 1884.

A. F. McLAIN, M.D., D.D.S., resigned Professorship of Dental Pathology and Therapeutics May 23, 1884.

JOHN W. ATKINSON, Ph.B., Assistant Instructor in Chemistry, resigned May 28, 1884.

E. O. COCHRANE, D.D.S., appointed to be Clinical Professor of Mechanical Dentistry * from June 3, 1884.

MAURICE J. SULLIVAN, D.D.S., appointed to be Clinical Professor of Operative Dentistry * from June 3, 1884.

H. G. WAUTON, B.A., temporary Instructor in English, relieved July 1, 1884.

E. J. WICKSON, A.M., appointed Lecturer on Dairying July 8, 1884.

ADOLPH SOMMER, Ph.G., appointed to be Assistant Instructor in Chemistry July 8, 1884.

JAMES P. H. DUNN, B.S., appointed to be Assistant in Chemistry July 8, 1884.

DAVID BARCROFT, Ph.B., Instructor in Civil Engineering, resigned August 1, 1884.

WILLIAM G. RAYMOND, C.E., appointed to be Instructor in Civil Engineering September 2, 1884, *vice* Instructor David Barcroft, resigned.

WILLIAM D. ARMES, Ph.B., appointed Assistant in English, 1884.

GEORGE C. EDWARDS, Ph.B., Instructor in Mathematics, promoted to be Assistant Professor of Mathematics December 2, 1884.

F. W. HATCH, M.D., Professor of Hygiene, deceased.

JOHN NORTON POMEROY, LL.D., Professor of Municipal Law, died February, 1885.

CHARLES W. SLACK, Ph.B., Acting Professor of Municipal Law, 1885.

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*Chair established June 3, 1884.

Wm. M. Searby, Ph.G., Professor of Materia Medica and Elementary Botany (Dean of Pharmaceutical Faculty). Succeeded in 1885 by Frederick Grazer, Ph.G., as Professor of Materia Medica, and by E. W. Runyon, Ph.G., as Dean of the Pharmaceutical Faculty.

Frederick Grazer, Ph.G., Professor of Materia Medica in the College of Pharmacy, 1885, *vice* Professor Wm. M. Searby.

Edward W. Runyon, Ph.G., Professor of the Theory and Practice of Pharmacy; made Professor of the Theory and Practice of Pharmacy and Dean of the Pharmaceutical Faculty, 1885.

Joseph W. Winans, A.M., Dean of the Law Faculty, 1885, *vice* Robert P. Hastings.

Wm. T. Reid, A.M., resignation of Presidency of the University of California accepted, to take place August 1, 1885.

John B. Clarke, Ph.B., Instructor in Mathematics, promoted to be Assistant Professor of Mathematics August 14, 1885.

Edward Lee Greene, appointed to be Instructor in Botany from September 17, 1885.

Hermann Kower, C.E., appointed to be Instructor in Instrumental Drawing October 9, 1885, *vice* Ross E. Browne, absent on leave.

Edward S. Holden, A.M., LL.D., elected to be President of the University of California, *vice* President W. T. Reid, resigned, and Director of the Lick Observatory, October 20, 1885.

S. B. Christy, Ph.B., Instructor in Mining and Metallurgy, promoted to be Professor of Mining and Metallurgy October 30, 1885.

L. L. Dunbar, D.D.S., appointed to be Professor of Pathology and Therapeutics June 3, 1884, *vice* Professor A. F. McLain, resigned December 1, 1885.

A. M. Wilder, M.D., Professor of Ophthalmology and Otology, died January 17, 1886.

G. H. Powers, M.D., appointed to be Professsor of Ophthalmology and Otology, March 2, 1886, *vice* A. M. Wilder, deceased.

G. A. Shurtleff, M.D., resignation of Professorship of Mental Diseases and Medical Jurisprudence accepted March 2, 1886.

William H. Mays, M.D., appointed to be Professor of Mental Diseases and Medical Jurisprudence, March 2, 1886, *vice* Professor G. A. Shurtleff, resigned.

G. A. Shurtleff, M.D., appointed to be Emeritus Professor of Mental Diseases and Medical Jurisprudence, March 2, 1886.

Washington Ayer, M.D., appointed to be Professor of Hygiene, March 2, 1886, *vice* Professor F. W. Hatch, deceased.

E. O. Cochrane, D.D.S., resignation of Clinical Professorship of Mechanical Dentistry accepted March 2, 1886.

H. J. Plomteaux, D.D.S., appointed to be Clinical Professor of Mechanical Dentistry, March 2, 1886, *vice* Professor E. O. Cochrane, resigned.

W. W. Deamer, A.B., Instructor in Latin and Recorder, promoted to be Instructor in Latin and Greek, March 2, 1886.

C. B. Bradley, A.B., Instructor in English, promoted to be Assistant Professor of the English Language and Literature, April 8, 1886.

H. J. Plomteaux, D.D.S., Clinical Professor of Mechanical Dentistry, resigned April 8, 1886.

A. L. Lengfeld, M.D., appointed Professor of Materia Medica and Chemistry (College of Dentistry), May 25, 1886.

W. B. Lewitt, M.D., appointed Professor of Anatomy in the College of Dentistry, from May 1, 1886.

F. Slate, Jr., Superintendent of the Physical Laboratory and Instructor in Mechanics and Physics, promoted to be Assistant Professor of Physics and Mechanics, June 1, 1886.

Ross E. Browne, resignation of Instructorship in Mechanical and other branches of Instrumental Drawing accepted June 29, 1886.

A. Wendell Jackson, Ph.B., Instructor in Mineralogy, Petrography and Economic Geology, promoted to be Professor of Mineralogy, Petrography, and Economic Geology,* from July 1, 1886.

Hermann Kower, C.E., appointed to be Instructor in Drawing from July 1, 1886.

E. J. Wickson, A.M., Lecturer on Practical Agriculture, promoted to be Lecturer on Practical Agriculture, and Assistant Superintendent of the Experimental Grounds from September 1, 1886.

H. B. Jones, Instructor in French, relieved, from and after September 1, 1886.

Edward T. Owen, A.B., appointed to be Professor of the French and Spanish Languages and Literatures,† from September 1, 1886.

Charles H. Levermore, Ph.D., appointed to be Instructor in History, from September 1, 1886.

J. H. Senger, A.B., appointed to be Instructor in German, from September 1, 1886.

Edmond C. O'Neill, Ph.B., Instructor in Chemistry, granted leave of absence from September 23, 1886, to September 23, 1887.

August Harding, appointed to be Instructor in Chemistry, from September 23, 1886, to September 23, 1887, *vice* Instructor O'Neill, absent on leave.

J. A. Hutton (First Lieutenant Eighth Infantry, U. S. A.), Professor of Military Science and Tactics, recalled by War Department, his term having expired.

G. F. E. Harrison (First Lieutenant Second Artillery, U. S. A.), detailed by War Department, succeeding J. A. Hutton as Professor of Military Science and Tactics, assumed duties September 23, 1886.

Wm. Dallam Armes, Ph.B., Assistant in English, resigned October 1, 1886.

RELATION OF THE UNIVERSITY TEACHING TO THAT IN THE OTHER PUBLIC SCHOOLS OF CALIFORNIA.

One of the most important of all public questions is that of education. Vast sums are spent to secure every advantage to every child. Our very existence as a State, and as a Nation, depends upon the character of the instruction given in our public schools, from the lowest to the highest. I submit some reflections upon this vital point.

In all considerations with regard to increasing the usefulness of the University to the State, we have to set out with certain fixed ideas. One of these is, that it is our highest duty to the State to see to it that we send our young men forth adequately equipped for their entrance into life. This equipment for the duties of life is of two kinds. It relates to their moral and to their mental fitness. We can do no greater injustice to the young men and young women whom we send forth, approved after our deliberate trial, than to certify to them that they *are* fully equipped, when we know that they are *not*. To do this is to poison the fountain at its very source. Speaking now only of their mental preparation, and neglecting for the moment the far more important question of the formation of a character—the sum of one's moral habitudes—and putting a part to stand for the whole, we may see that it is our very serious duty to insist that the *degrees* of the University shall stand for complete, consistent, thorough preparation.

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*Department created to date from July 1, 1886.

† Department created to date from September 1, 1886.

The experience of many an older University has proved to us that there is a certain fixed amount of work, all of which must be faithfully done by all students in order to entitle them to go out from us into life among the graduates of other learned institutions, and to bear their part on equal terms. Every motive of duty, of intelligence, of State pride even, impels us to insist that the B.A. and B.S. degrees delivered by the University to its graduates shall stand for an amount of mental work, and for a period of faithful and continued endeavor equal to those exacted by other colleges in other parts of the Union. All is perfectly plain so far, and there can be no one who will dissent from it.

There is a practical consideration that must be introduced here, about which there is also no argument. It has come to be a settled fact that the undergraduate college course must be one of four years, and no longer. We all know the reasons for this fixed term. We all know, too, that there is no *a priori* logical necessity for such a term. We all know that the ideal University is one where "any person can find instruction in any study," and where the degree granted is the sign for the work done, and has nothing to do with a commencement season, or with a cycle of four years. But this abstract proposition has no bearing upon our actual circumstances. For the present we are obliged to consider the period of four years to be the fixed term of college life.

Starting, then, with fixed requisites for the degrees of B.A. and B.S., and with a fixed period of four years between matriculation and graduation, and with a certain amount of work which can reasonably be demanded of our students within the period fixed by custom, we arrive at a fixed standard at which our requisites for admission must be set. There is no escape from the argument. Just as a straight line of fixed length and direction which starts from a given point must inevitably terminate at another point equally fixed, so it is true that with a fixed standard of acquirement for the degrees, and with a fixed term of four years to student life, a fixed standard for entrance examinations must be prescribed. No part of the logical series can be altered. No one is willing to debase the value of the solemn certificate of the University; no one is willing to increase the four years of probation to four and a half, or five; and hence the University should not be permitted to lower the standard required for its entrance.

As time goes on, and as society becomes more complex, and as intelligence is more and more drawn upon, the standards must be even raised. Special subjects will have to be added to the curriculum, and time will have to be gained for them. Fortunately for this particular problem, life itself is governed by general principles, and these general principles it is mainly the function of the University to teach.

The accompanying table, which has been kindly compiled for me by Assistant Professor CLARKE, presents a general view of the courses of study in our public schools, these courses being three in number. *First*, the ordinary common school course of our cities, comprising (*a*) Primary, (*b*) Grammar, and (*c*) High Schools. *Second*, the CAMINETTI course, covering the Grammar School and part of the High School work of the first course, and principally intended for preparing pupils for the Science Colleges of the University. *Third*, the Normal Schools, occupying a somewhat anomalous position, with a curriculum in general parallel to the curriculum of the Grammar grades, but extending also into High School work. The three main vertical columns of the table represent, as indicated, the three great divisions—Primary, Grammar, and High School work. Each rectangle, in either the second or the third of these columns, represents the work of a year. The position of any such rectangle along the horizontal row in which it occurs, shows, therefore, the character of the work in that particular course and for that particular year. All work, in Mathematics, for example, in the same vertical column *should be* of the same grade. Whether it is actually so or not depends on considerations—distribution of work, character of teachers, etc.—of which it is practically impossible to take note in forming such a table.

A glance at the table shows that the Primary and Grammar courses are both too long and too much diluted. That this fact is recognized by teachers is evident from the curricula of the Caminetti schools; and in some counties, Amador, for example (the home of Caminetti), the condensation is carried even farther than here indicated, the course being completed in four years, instead of five. These Caminetti courses have not yet been established long enough to enable us to know much of their practical workings. Still they are excellent *criteria* of the opinions and judgment of the teachers of the State.

The common schools (Primary, Grammar, and High) have a twofold function. The great majority of the pupils must be immediately equipped for the struggle of active life; the others are to be so instructed that they may avail themselves, to the fullest extent, of the advantages and privileges of the University. To say that in the Primary and Grammar schools these two objects must be attained, to a great extent, if not entirely, by means of a single course, suited, so far as practicable, to the accomplishment of both, is simply to assert a truism. To organize separate courses in Grammar schools would be at present impracticable, if the attempt were made to carry out the segregation of work earlier than the seventh year (second grade). There are three "critical stages" in the average schoolboy's career—the day he leaves the fourth grade, the day he completes his Grammar School course, and the day he graduates from the High School. At these stages the public schools suffer their heaviest losses, so far as the "number of pupils enrolled" is concerned. This fact enables us to classify the pupils as follows:

- 1. Those dropping out at the end of the sixth year.
- 2. Those passing into the Grammar grades.
    - *A.* Those whose school career terminates at the end of the Grammar School course.
    - *B.* Those who enter the High School.
        - *C.* Those who go into business on graduation from the High School.
        - *D.* Those who enter the University.

1. Pupils of the first class do not properly come before us in our general investigation; yet a word concerning them may not be out of place. A proper condensation of the primary course would enable these pupils to complete Arithmetic, so far as its most important features are concerned, and to secure sufficient training in language to speak and write English with grammatical correctness and business accuracy. Elementary instruction in Bookkeeping should be given in the fourth grade; not deferred, as usual, for a period varying from a year and a half to three years. Drawing, freehand and mechanical, should also receive much attention.

2. In speaking of those pupils who enter the Grammar grades I will confine myself principally to Mathematical studies, though much might

be said concerning the faulty and diluted curricula in English and Natural Science. The great objection to the Grammar School curriculum is the ridiculously long time—three years—devoted to Arithmetic. This should be reduced by at least two years; a thorough course in Arithmetic should be completed in the third grade, though a short review may be taken with profit after the completion of an elementary course in Algebra. Without the elements of Algebra the pupil is not likely to thoroughly master the *principles* of Arithmetic although he may be skilled in its practice. Just here, however, we observe the necessity of a further classification of the Grammar School pupils. The majority can spend but two years in school after completing their third grade work; the remainder go on into the High School. Even the former need some mathematical training in addition to their Arithmetical work, no matter what they propose to do after leaving school. For those, especially, who intend to go into workshops of any kind whatever, an elementary course in Geometry is not simply important, but urgently required. Such a course would naturally be succeeded by a similar one in Algebra. To those who go into the counting-house, Geometry would be exceedingly useful, in its relation to mensuration, etc.; elementary Algebra is perhaps even more important. But any higher mathematics assigned these pupils must clearly be very different in character and scope from the work assigned those other pupils who propose to continue their studies in the High School and the University. The former work, however elementary, must be given in courses complete in themselves; the latter will be simply preparatory. Hence the advisability of separating the pupils, leaving the third grade into two great classes, according as they propose to continue their work beyond the Grammar school or not. For the latter the work of the second and first grades should comprise, in addition to courses in Algebra and Geometry, Freehand and Mechanical Drawing, about such a course as is laid down for the San Francisco Commercial School. An election between Drawing and one modern language would materially increase the usefulness of the school, particularly so far as it is intended to fill the wants of pupils desirous of engaging in mercantile pursuits.

The pupils who continue their studies beyond the Grammar School course may now be expected to do better work in the second and first grades. The classes will be homogeneous, non-essentials may be dropped, and the instruction will naturally be directed to the single end of securing the best preparation for the advanced training of the higher schools. The courses in Geometry and Algebra can be made more thorough than in the commercial class, and when the pupil enters the High School he should be well grounded in Plane Geometry and Algebra, at least "as far as Quadratics." This will enable the High School to complete the common Algebra, Solid Geometry, and Trigonometry. The graduate of this school will thus be thoroughly equipped for the every day mathematical experience of practical life, even if he pursues his studies no farther, while if he enter the University he will be in a position to profit by its advanced instruction. In fact we may here emphasize the importance, to all our people, of terminating the waste of time and energy that must impair the efficiency of our preparatory schools, and we can understand that the twofold function of the preparatory school is in general best performed when the teachers in charge realize the importance of a distinct and definite coöperation with the University. The University may be taken as the representative of the most advanced forms of that training and that culture which conduce to the best interests of the people of the whole commonwealth; hence that preparatory training is *caeteris paribus*, the best which most directly and positively points toward the University.

		Primary Grades—5 Years.	6th Year—Grammar Grades—8th Year.		
Mathematics.	Common.	Arithmetic, through Decimals.	Arithmetic.—*Three years*, at an average rate of about 4 hours per week, spent on percentage, etc. The subject is reviewed in the High School. Over eight years on arithmetic only in a short life!		
	Cam.	Arithmetic, through Decimals.	Arithmetic, inclusive of Book-keeping, completed in two years.		Algebra to Quadratics.
	Normal.		Arithmetic and Book-keeping completed. Algebra to Radicals—mere introduction to the subject.		Algebra, through "Simple" Equations. Introduction to Elementary Geometry.
English.	Common.	Elementary Exercises. Readers I to IV. Letter-writing and Composition.	IV and V Readers and Supplementary Reading. Language Lessons, Word Analysis, Spelling, Grammar, Composition, Exercises. Course extending over 3 years.		
	Caminetti.	Elementary Exercises. Readers I to IV. Letter-writing and Composition.	V Reader begun. Word Analysis. Test Speller. Grammar and Composition. (2 years.)	V Reader (completed). "Tom Brown at Rugby."	"Lady of the Lake." "Evangeline." Irving's "Alhambra." "Lay of the Last Minstrel."
	Normal.		Spelling. Analysis and Parsing, verbs being a special study.	Spelling. Grammar (completed). Word Analysis. Composition.	Rhetoric, with much exercise in writing. "English Literature from the best authors."
Science.	Common.	Object Lessons. Geography begun. Elementary Physiology begun.	Geography. Physiology.	Geography. Physiology. Introduction to Physics.	Geography. Physiology. Elementary Physics.
	Caminetti.	Object Lessons. Geography begun. Elementary Physiology begun.	Geography.	Physiology. Botany.	Physical Geography. Physics. Botany.
	Normal.		Geography.	Elementary Botany. Physiology. Lectures on Chemistry and Physics.	Reviews. Lectures on Astronomy and Geology
History.	Com.	No formal study of History.		History of the United States.	History of the United States.
	Cam.	No formal study of History.		History of the United States.	
	Normal.				History of the United of Greece, Rome, and
Foreign and Classical Lang.	Common.	No formal instruction in Latin or Greek. Instruction in French, German, or other modern languages of foreign nations rarely given except in a limited number of so-called "Cosmopolitan Schools."			
	Cam.				
	Normal.				

	9th Year—High School Grades—11th Year.		
Classical and Literary.	Algebra, through Quadratics.	Geometry, IV Books. Arithmetic (reviewed).	Geometry, VI Books of Venable. Not required in Classical Course. Algebra (review).
Scientific Course.	Algebra, through Quadratics. Book-keeping.	Geometry, IV Books. Arithmetic (reviewed).	Geometry, VI Books (Venable). Algebra (review).
	Plane Geometry.	Algebra—Thorough Review.	
	Grammar. "American Poems." "Tom Brown at Rugby." "Lady of the Lake."	Irving's "Alhambra." "Lay of the Last Minstrel." "Merchant of Venice." "Sir Roger de Coverley." "Vision of Sir Launfal."	Hale's "Longer English Poems." "The Newcomes." "Julius Cæsar." Rhetoric.
	Whittier's "Snow-Bound." "Vision of Sir Launfal." "Sir Roger de Coverley." Burke's Select Works, Vol. I. Rhetoric.	"Julius Cæsar." Hale's "Longer English Poems." "The Newcomes." Kellog's "English Literature." Composition and Rhetoric.	
	Physical Geography.	Chemistry. Physics. Botany (required only for Scientific Course).	Astronomy.
	Physiology. Zoology.	Chemistry (optional). Reviews (miscellaneous).	
	English and Roman History.		History of Greece.
	States, with a review of the History England.		
Sc.			
Literary. High School.	Latin, French, or German begun.	Latin Grammar and Cæsar. Souvestre; Achard, or Fouqué and Schiller.	Cicero and Vergil. Lamartine; Chateaubriand, or Goethe and Lessing.
Classical.	Latin Grammar. Leighton's Lessons. Cæsar, Gallic War begun.	IV Books Cæsar completed. Syntax. Greek; Grammar and White's "Lessons;" Greek Reader; Anabasis begun.	Cicero and Vergil. Latin composition. Anabasis completed, IV Books. Iliad, I, II. Greek composition.
Cam.			
Norm.			

The proposed segregation of classes and work in the second and first grades might prove highly advantageous in another important particular. Whatever may be said concerning the expediency of teaching elementary natural science to those who must get what they can in this direction from the Grammar School, it will, I think, be conceded that for those who are to enter college a two-years' drill in some modern language would be of vastly more service. If the five years between the third grade and University matriculation were spent in acquiring a good knowledge of French and German, even at the expense of some of the higher critical work in English, the pupil would find the work of inestimable benefit, not only in saving valuable time at the University, but also on account of the increased facilities it would give for scientific and professional study. It is by no means certain that those who do not propose to enter even the High School might not be materially benefited by the study of at least one modern language besides their own. Hence the pertinence of the suggested election in the commercial class.

If the High School can get the relief that would be afforded by the suggested changes in the Grammar School curriculum, it would soon be able, with the increase in its available time, and the improvement in the preparation of its pupils, to strengthen and expand its course into one far more thorough and extended. Our High Schools should be the peers of the best eastern academies. With a system of preparatory schools of this grade the University would soon be able to raise its standard for matriculation, extend its curricula, and broaden its field of usefulness, and the benefits that would accrue to the whole educational system would be definite and such as to be plainly evident to all.

The CAMINETTI courses, it will be observed, present much better curricula than the ordinary city schools. It will be interesting to learn from actual experience which of the CAMINETTI systems is the better: the Northern, four-year course, or the Southern, five-year course. There is one great drawback, however, to both; a difficulty not easily overcome. Work, the proper performance of which requires a high order of special teaching, is assigned to schools that cannot but be imperfectly graded. Unless, therefore, these schools are so fortunate as to secure exceptionally able and conscientious teachers, they will of necessity struggle under very great disadvantages as compared with city High Schools, in which it is customary to employ special teachers, each in charge of a single department.

These considerations are not without some bearing on the recommendation that Geometry and Algebra should be introduced into the first and second grades of the Grammar School courses. But the difficulty here is not so formidable. If the plan were found to be even moderately successful, the difficulty would be, at least to a great extent, overcome by having the High School course begin a year earlier than now, and extend through four years. The pupils would then secure instruction by special teachers a year earlier than now, and it is more than probable that a much larger number would enter the High School than now enter. More would then take the whole course, for the great loss of pupils takes place, not in the classes of the Grammar or High Schools, but just at the transition from the former to the latter. While the necessary expenses of school departments would not be increased, the improved methods of instruction could not fail to be highly beneficial to the pupils, and the greater number of teachers interested in special departments of thought, and therefore more enthusiastic in their work than the average "class teacher," could not fail to infuse into the profession an *esprit du corps* that would be, not only a matter of gratification to its members, but also, through them, a permanent and far-reaching benefit to the community at large.

Changes in curricula, however, are of themselves of little value, unless carried out under the supervision and through the instrumentality of able. devoted, and sympathetic teachers. The great drawback in our High School system is the lack of competent teachers trained, not simply in the mere rudiments of the subjects they are to teach, but also in the higher departments of these subjects. One cause of this difficulty will be rendered evident by a comparison of the accompanying table with the school law of California. By that law, all graduates of the State Normal School are entitled to certificates giving them the right to teach in High Schools, while the curriculum of the Normal School is considerably *less* extensive than that of the High Schools themselves.

It is true the County Boards are not *required* to issue certificates on Normal School diplomas, but they are authorized to do so, and, in fact, do so. City Boards, I am advised, do likewise. The case of San Francisco is exceptional, as this city supports a Normal School of its own, but, singularly enough, only for young ladies. The State Normal School diploma thus leads to a certificate entitling a graduate to teach, in a High School, subjects in which he has had no instruction whatever. The remedy for this abuse is clear. No person should be permitted to hold, without examination, a certificate entitling him to teach in the *High Schools*, unless he be a graduate of the University. Again, University graduates, duly recommended, should receive the highest certificate that can be granted. The Faculties of the University will not recommend for a teacher's certificate any one in whom they have not full confidence, both as regards scholastic attainments and teaching ability.

High Schools thus directed by able and enthusiastic workers, familiar with the drift of the best modern thought in their respective departments, cannot fail to take the foremost rank. The University, no longer handicapped, as in the past, by the necessity of doing work that should be done in preparatory schools, will be able to take her proper position among the leading institutions of the American States. The demand for improvement is so emphatic that it cannot long be ignored.

TABLES GIVING THE RELATIVE NUMBERS OF CONDITIONS IN THE VARIOUS SUBJECTS, FOR ENTRANCE EXAMINATIONS, 1885, AND 1886.

I give below certain tables bearing on the important question of the thoroughness of the preparation of our candidates in the various subjects which we require. The tables have been compiled by the Recorder, Mr. Chas. A. Ramm.

I. Matriculation Examination—1885.

Admitted on recommendation from accredited public schools	19	
Candidates for entrance by examination	88	= 100.00 per cent.
Examined and admitted clear	$\frac{14}{88}$	= 15.90 per cent.
Examined and admitted on condition	$\frac{51}{88}$	= 57.95 per cent.
Examined and rejected	$\frac{23}{88}$	= 26.15 per cent.
		100.00 per cent.

The various conditions were given in subjects as below:

Conditioned in English (Subject 1)	$\frac{19}{77}$	= 24.67 per cent.
Conditioned in Arithmetic	$\frac{28}{85}$	= 30.36 per cent.
Conditioned in Algebra	$\frac{39}{79}$	= 49.37 per cent.
Conditioned in Geometry	$\frac{36}{75}$	= 48.00 per cent.
Conditioned in Geography	$\frac{13}{77}$	= 16.88 per cent.
Conditioned in United States History	$\frac{13}{77}$	= 16.88 per cent.
Conditioned in Cæsar	$\frac{5}{29}$	= 17.25 per cent.
Conditioned in Latin at sight	$\frac{6}{23}$	= 26.09 per cent.
Conditioned in Latin Composition I	$\frac{10}{26}$	= 38.46 per cent.
Conditioned in Latin Composition II	$\frac{10}{23}$	= 43.47 per cent.
Conditioned in Cicero I	$\frac{5}{27}$	= 18.52 per cent.
Conditioned in Cicero II	$\frac{5}{23}$	= 21.74 per cent.
Conditioned in Vergil	$\frac{6}{22}$	= 26.36 per cent.
Conditioned in Anabasis	$\frac{3}{9}$	= 33.33 per cent.
Conditioned in Greek at sight	$\frac{3}{9}$	= 33.33 per cent.
Conditioned in Homer	$\frac{1}{8}$	= 12.50 per cent.
Conditioned in Greek Composition	$\frac{1}{6}$	= 16.66 per cent.
Conditioned in Greek History	$\frac{4}{27}$	= 14.81 per cent.
Conditioned in Roman History	$\frac{1}{25}$	= 4.00 per cent.
Conditioned in Chemistry	$\frac{7}{33}$	= 21.21 per cent.
Conditioned in Natural Philosophy	$\frac{7}{48}$	= 14.58 per cent.
Conditioned in Physiology	$\frac{7}{35}$	= 20.00 per cent.
Conditioned in Trigonometry	$\frac{0}{3}$	= —— per cent.
Conditioned in Botany	$\frac{1}{9}$	= 11.11 per cent.
Conditioned in Drawing	$\frac{1}{6}$	= 16.66 per cent.
Conditioned in English History	$\frac{1}{11}$	= 9.999 per cent.
Conditioned in English (Subject 14)	$\frac{12}{32}$	= 47.50 per cent.

II. Matriculation Examination—1886.

Applicants examined	71
Applicants admitted without examination:	
On recommendation from accredited public schools	34
As Graduate Students	5
As Limited and Special Students	6
On presentation of certificates from other colleges	2
As Visitors	17
Total number of applicants for admission	135
Of these applicants for admission there were admitted to standing as Graduate, Regular, At Large, Special, and Limited Students	106
Admitted as visitors	19
Rejected and withdrawn	10
	135
Of the applicants examined there were admitted clear	17
Admitted with conditions	42
Rejected	8
Withdrawn	2
Admitted as visitors	2
	71

In the examination held in July, 1886, the various conditions were given in subjects, as below:

Conditioned in English (1)	$\frac{14}{36}$	= 38.88 per cent.
Conditioned in Arithmetic	$\frac{13}{34}$	= 38.23 per cent.
Conditioned in Algebra	$\frac{11}{35}$	= 31.43 per cent.
Conditioned in Geometry	$\frac{24}{35}$	= 68.57 per cent.
Conditioned in Geography	$\frac{3}{33}$	= 9.09 per cent.
Conditioned in United States History	$\frac{6}{30}$	= 20.00 per cent.
Conditioned in Cæsar	$\frac{2}{18}$	= 11.11 per cent.
Conditioned in Latin at sight	$\frac{0}{10}$	= —— per cent.
Conditioned in Latin Composition, 1° paper	$\frac{8}{17}$	= 47.05 per cent.
Conditioned in Latin Composition, 2° paper	$\frac{2}{6}$	= 33.33 per cent.
Conditioned in Cicero, 1° paper	$\frac{2}{18}$	= 11.11 per cent.
Conditioned in Cicero, 2° paper	$\frac{0}{9}$	= —— per cent.
Conditioned in Vergil	$\frac{2}{10}$	= 20.00 per cent.
Conditioned in Anabasis, Greek at sight and Homer	$\frac{0}{2}$	= —— per cent.
Conditioned in Greek Composition	$\frac{1}{2}$	= 50.00 per cent.
Conditioned in Greek History	$\frac{0}{11}$	= —— per cent.
Conditioned in Roman History	$\frac{0}{8}$	= —— per cent.
Conditioned in English (14)	$\frac{7}{11}$	= 63.63 per cent.
Conditioned in Physics	$\frac{5}{17}$	= 29.41 per cent.
Conditioned in Botany	$\frac{1}{9}$	= 11.11 per cent.
Conditioned in Chemistry	$\frac{0}{10}$	= —— per cent.
Conditioned in Physiology	$\frac{3}{18}$	= 16.66 per cent.
Conditioned in Free-Hand Drawing	$\frac{1}{3}$	= 33.33 per cent.
Conditioned in Trigonometry	$\frac{0}{5}$	= —— per cent.

The per cents in the foregoing table cannot rightly be compared with those in the table for 1885, above, for the reason that the latter showed the results of both of the examinations in 1885, *i. e.*, those in June and September. The September examination not only includes new applicants, but affords an opportunity for the removal of conditions given in June. A table giving final results of both entrance examinations in 1886 is given below:

Conditioned in English (1)	$\frac{20}{72}$	= 27.77 per cent.
Conditioned in Arithmetic	$\frac{11}{67}$	= 16.41 per cent.
Conditioned in Algebra	$\frac{19}{69}$	= 27.53 per cent.
Conditioned in Geometry	$\frac{42}{73}$	= 57.53 per cent.
Conditioned in Geography	$\frac{6}{64}$	= 9.37 per cent.
Conditioned in U. S. History	$\frac{12}{68}$	= 17.64 per cent.
Conditioned in Cæsar	$\frac{2}{29}$	= 6.89 per cent.
Conditioned in Latin at sight	$\frac{0}{21}$	= —— per cent.
Conditioned in Latin Composition I	$\frac{7}{30}$	= 23.33 per cent.
Conditioned in Latin Composition II	$\frac{8}{19}$	= 42.10 per cent.
Conditioned in Cicero I	$\frac{4}{30}$	= 13.33 per cent.
Conditioned in Cicero II	$\frac{1}{21}$	= 4.76 per cent.
Conditioned in Vergil	$\frac{1}{21}$	= 4.76 per cent.
Conditioned in Anabasis	$\frac{1}{6}$	= 16.66 per cent.
Conditioned in Greek at sight	$\frac{1}{6}$	= 16.66 per cent.
Conditioned in Homer	$\frac{1}{7}$	= 14.18 per cent.
Conditioned in Greek Composition	$\frac{3}{6}$	= 50.00 per cent.
Conditioned in Greek History	$\frac{0}{26}$	= —— per cent.
Conditioned in Roman History	$\frac{0}{23}$	= —— per cent.
Conditioned in Physics	$\frac{12}{28}$	= 42.85 per cent.
Conditioned in Chemistry	$\frac{0}{22}$	= —— per cent.
Conditioned in Botany	$\frac{0}{11}$	= —— per cent.
Conditioned in Physiology	$\frac{3}{26}$	= 11.54 per cent.
Conditioned in Trigonometry	$\frac{1}{8}$	= 12.50 per cent.
Conditioned in Drawing	$\frac{1}{5}$	= 20.00 per cent.
Conditioned in English History	$\frac{4}{13}$	= 30.76 per cent.
Conditioned in English (14)	$\frac{11}{28}$	= 39.28 per cent.

COMPARISON OF THE ENTRANCE EXAMINATIONS REQUIRED AT THE UNIVERSITY OF CALIFORNIA WITH THOSE REQUIRED AT OTHER COLLEGES.

I have to thank Mr. W. W. Deamer, Instructor in Latin and Greek, for the data of the following table, which gives a comparison between the entrance requirements of the various colleges named in the second column.

Column 1 gives the date of the charter; column 2, the name of the college; columns 3, 4, 5, etc., give the requirements for entrance in the subjects of English, Arithmetic, Algebra, Geometry, History, and Geography, Latin, Greek, Ancient History, Science, Modern Languages. The data given in the table are selected from the last available registers of the various colleges.

Where the requirements of a given college, as here given, are *greater* than the requirements for the Classical Course in the University of California, I have marked a *plus* sign (thus +); where less, a *minus* sign (thus —). Where they are the same as those in our own Classical Course, the space is either left blank or marked "same as University of California."

In spite of our pains errors may easily remain in this compilation.

It is clear that only the paper requirements are here exhibited, and that a college having greater nominal requirements may actually be easier to enter than the University of California.

Everything depends on the rigor with which the requirements are enforced. It is our practice to set thorough papers, and to condition the applicant when the examination is not up to a high standard.

The nature of our own examination papers may be seen by consulting *Bulletin* No. 6, editions 6 (1881–2), 7 (1882–3), 8 (1883–4), 9 (1885), and 10 (1886).

Students having three conditions (unless in important subjects) are usually allowed to enter, and are obliged to make up these conditions at the time of the entrance examinations next following their Freshman year.

Conditions in the subjects of Arithmetic, Geography, and the Histories, are practically given less weight than those in other topics.

A condition in any subject continued in the University *may* be removed without a formal examination, provided the student has done exceptionally good work in that subject during the year.

Y.	Science.	Modern Languages.

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Date of Charter	Name of Institution	English	Arithmetic	Algebra	Geometry	History and Geography	Latin	Greek	Ancient History	Science	Modern Languages
1868	UNIVERSITY OF CALIFORNIA Classical Course Degree of A.B.	[illegible] the time of the examination [illegible] from [illegible] Lake [illegible] Macbeth [illegible] Julius Cæsar [illegible] [illegible] Rhetoric [illegible]	Including the Metric system [illegible]	To Quadratic Equations	Plane Geometry, except the metrical properties of regular polygons and of circles	History of the U. S. and the general facts of Physical and Political Geography	[illegible] Gallic War [illegible] I-IV [illegible] the Orations [illegible] Æneid I-VI [illegible] at sight [illegible] composition, grammar and prosody	[illegible] I-IV White's [illegible] Iliad I-III [illegible] Greek [illegible] grammar [illegible] prosody	Greek History to the death of Alexander [illegible] Roman History to the death of [illegible] with ancient geography		
	Literary Course Degree of B.L.	Same as for Classical Course	Same as for Classical Course	Same as for Classical Course.	Same as for Classical Course	Same as for Classical Course	Same as for Classical Course		Same as for Classical Course	[illegible] Physics [illegible] Botany [illegible]	
	Course in Science Degree of Ph.B.	Same as for Classical Course, with additional examination [illegible] of the following works: *Lay of the Last Minstrel*, [illegible] *Evangeline*, *Sir Launfal*, *Sir Roger de Coverley*, [illegible] *Burke*, vol. I, and [illegible] *English Poems*, omitting *Laodamia* and *Idiots* Word derivation	Same as for Classical Course	Including Quadratic Equations	Plane Geometry, including the metrical properties of regular polygons and the measurement of the circle	Same as for Classical Course, with addition of English History				Same as for Literary Course	
1636	HARVARD COLLEGE. Candidate for A.B.	Short composition upon a subject announced at the time of the examination and taken from one or more of the following works: *Julius Cæsar*, *Macbeth*, the first two books of *Paradise Lost*, *Tale of Two Cities*, *Abbot*, *Rape of the Lock*, *Vision of Sir Launfal*, *She Stoops to Conquer* Correction of bad English	Including Metric system, but not the technical parts of Commercial Arithmetic Same as University of California	Through Quadratic Equations	Plane Geometry as in first 13 chapters of Peirce's Geometry Elective with Latin, Greek and Science groups (two groups to be taken): Logarithms, Plane Trigonometry, Solid Geometry.		Cæsar, *Gallic War*, I-IV, or I-III and Sallust's *Catiline*; *Æneid*, I-VI, or I-V and *Eclogues*; [illegible] at sight; Latin composition, grammar, prosody, antiquities. Elective with Greek, Mathematics and Science Groups (two groups to be taken) Orations against Catiline and for Archias; sight translation of Cicero, *Æneid* and *Metamorphoses*; Latin composition	Xenophon at sight, presupposing study of [illegible] I-IV or to page 111 of Goodwin's [illegible] Greek composition, as in first [illegible] White's *First Lessons* Elective with Latin, Mathematics and Science Groups (two groups to be taken) Sight translation of Herodotus, or Herodotus VII, 1-239, and VIII, simple Greek prose composition, sight translation of *Iliad*, or *Iliad* I, II, [illegible] and III Prescribed, less than in University of California; elective, more	Greek History to the death of Alexander Roman History to the death of Commodus	Rolfe and Gillet's (without [illegible]) or Avery's or Gage's [illegible] of Physics Elective with Latin, Greek, and Mathematical Groups (two groups to be taken) Physics (B. Stewart's *Elementary Physics*), either Elementary Chemistry or Botany	Sight translation of easy French prose or of easy German prose
1701	YALE COLLEGE A.B.		Higher Arithmetic including Metric system.	To Logarithms, in Loomis's Treatise	Euclid, I, and the first 33 exercises in Todhunter's edition for four books of other Geometries, with above exercises Same as University of California.		Grammar, Cæsar, *Gallic War*, I-III; Cicero against Catiline and for Archias; Vergil *Bucolics*, *Æneid*, I-VI, with Prosody; Ovid, *Metamorphoses*, at sight; sight translation of prose; prose composition	Grammar, Composition; *Anabasis*, 3 books; *Iliad*, 2 books, with Prosody; sight translation of Xenophon.	Roman History, as in Creighton's *Primer* Greek History as in Smith's or Fyffe's text books.		Sight translation of easy prose in either French or German
1746	COLLEGE OF NEW JERSEY	Grammar; short essay (in 1885 on J. F. Cooper, life and one novel)	Including Metric system	Through Quadratics and Radicals	Euclid I and II.	Geography and U. S. History	Grammar and Prosody; Cæsar, 4 books; *Catiline* or *Jugurtha*; *Æneid*, 6 books; 6 Orations of Cicero; Composition; Ancient Geography	Grammar and Prosody; *Anabasis*, 4 books; Homer, 2 books; Greek composition; Geography Same as University of California.			
1754	COLUMBIA COLLEGE.	English Grammar. Composition on subject given at time of examination	Including Metric system.	First 5 chapters of Peck's Manual Same as University of California	First 4 books of Davies' Legendre Same as University of California	Geography.	Grammar and Prosody; Composition; Cæsar, 5 books; *Eclogues* and *Æneid*, 6 books; [illegible] Orations of Cicero	Grammar and Prosody, Composition; *Anabasis*, 4 books; *Iliad*, 3 books	As in Rawlinson's *Manual of Ancient History*		
1755.	UNIVERSITY OF PENNSYLVANIA	Grammar (as in Abbott's *How to Parse*, or Whitney's *Essentials of English Grammar*), Abbott's *How to Write Clearly*. Composition on subject from the last-named of the following works (all to be read): Macaulay's *England*, chaps VII to XII, *Marble Faun*, Franklin on *Education*, and *Macaulay*	Including decimal system of weights and measures.	Through Quadratic Equations.	Plane Geometry.	Ancient and Modern Geography. U. S. History	Grammar; Cæsar, *Gallic War*, I-III; *Æneid*, I-VI; Cicero, 5 orations; Arnold's *Latin Prose Composition* to Exercise 21.	Grammar; Arnold's *Greek Prose Composition*, to Exercise 26; Xenophon, *Anabasis* I-IV; *Iliad*, I-III	Freeman's *General Sketch of History*, chapters I-VI		
[illegible]	[illegible]	[illegible] taken from one of the following [illegible] *Macbeth*, [illegible] *Tale of* [illegible] *Rape of the Lock*, *Vision of Sir Launfal*	Including Metric system	Through Equations of Second Degree, Progression, and Binomial Formula.	Plane Geometry		*Gallic War*, I-IV, or I-III and Sallust's *Catiline*; Ovid, 2500 lines; orations against Catiline and for Archias; *Æneid*, I-VI, or I-V and *Eclogues*; sight translation of Cæsar, Cicero, Vergil, and Ovid; composition.	Grammar; Harkness's *First Greek Book*; *Anabasis*, or 4 books of *Anabasis* and 2 books of Homer; 20 exercises of Arnold's *Greek Prose Composition* (Real equivalents received)	Greek History to death of Alexander Roman History and Geography to end of Marcus Aurelius' reign		[illegible] including [illegible]
[illegible]	DARTMOUTH COLLEGE	Grammar and Spelling. Short essay on subject from one of the following works: *Autocrat of the Breakfast-Table*, *Kenilworth*, *Lay of the Last Minstrel*, *Coriolanus*	Including Metric system.	Through Quadratic Equations, including Radicals.	Plane Geometry (4 books of Wentworth) including Exercises. Same as University of California.	Geography. U. S. History.	Grammar and Prosody; Jones's *Latin Composition*, or equivalent; *Gallic War*, I-IV, or I-II and Sallust's *Catiline*; *Æneid*, I-VI; Cicero, 7 orations; geography and mythology involved; sight reading	Grammar and Prosody; 3 books of *Anabasis*; Arnold's *First Greek Book*; Jones's *Greek Composition*; *Iliad*, 3 books; subject matter of above; sight reading; geography	Smith's *Smaller History of Rome* to time of Empire Smith's *Smaller History of Greece*		
1791	UNIVERSITY OF VERMONT	Grammar, Orthography, and Punctuation It is desired that the following works be read: *Richard III*, *Kenilworth*, *Sketch Book*, *Webster's Reply to Hayne*	Arithmetic	Through Quadratic Equations.	Plane Geometry.	Ancient and Modern Geography.	Grammar and Prosody; Cæsar, 3 books; Cicero, 6 orations and *De Amicitia*; *Æneid*, 6 books, and *Eclogues*; Jones's *Latin Prose Composition*, 30 lessons	Grammar and Prosody; *Anabasis*, 4 books; *Iliad*, 2 books; Jones's *Greek Prose Composition*, [illegible] 25 lessons	Roman History to Augustus Greek History to death of Alexander		
1793	WILLIAMS COLLEGE	Short composition on subject taken from one of the following works: *Macbeth*, *Julius Cæsar*, *Paradise Lost*, I-II, *Abbot*, *Rape of the Lock*, *Sir Launfal*, *She Stoops to Conquer*.	Including Metric system.	Through Quadratic Equations, including Radicals.	Plane Geometry	Ancient and Modern Geography.	Grammar and composition; Cæsar, 4 books; Cicero, 7 orations; *Æneid*, 8 books, and *Bucolics*; sight reading	Grammar and composition; *Anabasis*, 4 books; *Iliad*, 2 books; sight reading Same as University of California	Greek History to death of Alexander and Roman History to Augustus		
1825	AMHERST COLLEGE	Correction of incorrect English, short composition on subject taken from one of the following works: *Macbeth*, *Julius Cæsar*, *Paradise Lost*, I-II, *Tale of Two Cities*, *Abbot*, *Rape of the Lock*, *Vision of Sir Launfal*, *She Stoops to Conquer*	Including Metric system.	Through Quadratic Equations, Radicals, Progression, and Binomial Theorem.	Plane Geometry.		*Gallic War*, I-IV; Orations against Catiline and for Archias; *Æneid*, I-VI, or I-V and *Eclogues*; sight translation from Cæsar, Cicero, *Æneid*, and *Metamorphoses*; composition, grammar, prosody, subject-matter, etc.	Grammar; Jones's *Greek Prose*, 24 exercises; *Anabasis*, 4 books; *Iliad*, 3 books; sight reading	Greece to death of Alexander; Rome to death of Marcus Aurelius, with geography		Keetels's *First Course*, *French Grammar*, or Otto's, Part I
1837	UNIVERSITY OF MICHIGAN	Grammatical and Rhetorical Analysis. Short essay on subject taken from the following works: *Merchant of Venice*, *Deserted Village*, *Mill on the Floss*	Including Metric system.	Through Quadratics, Progression, and Logarithms.	Plane, Solid, and Spherical Geometry	Physical Geography, Ancient and Modern Political Geography History of U. S. to the close of Revolutionary War	Grammar; prose composition; Cæsar, 4 books; Cicero, 6 orations; all of the *Æneid*, or 6 books of *Æneid* and *Eclogues* and *Georgics*, or other equivalents; prosody	Grammar and etymology; Jones's *Prose Composition*; *Anabasis*, 4 books	First three books of Smith's *History of Greece*, omitting chapters on literature and Art Leighton's *History of Rome*, to accession of Augustus.		
1848	UNIVERSITY OF WISCONSIN.	Reading, spelling, penmanship, grammar Short composition on subject taken from the following works: *Merchant of Venice*, *Evangeline*, *Romola*.	Arithmetic.	Algebra through Quadratics	Plane Geometry.	Political and Physical Geography U. S. History Thalheimer's *History of England*	Grammar and composition; Cæsar, 4 books; Sallust's *Catiline*; Cicero, 6 orations; Vergil, 6 books; Latin at sight; prosody	*Anabasis*, 4 books; *Iliad*, 2 books; Jones's *Composition*	As in Barnes's *Brief History of Ancient Peoples*; geography		
1883	UNIVERSITY OF TEXAS	Short composition	Including Metric system.	Including Radicals and Quadratics	Plane Geometry, 6 books Halsted.		Grammar, any 2 books of Cæsar, 3 orations of Cicero, *Æneid*, I-II; elementary composition	Grammar; 2 books *Anabasis*; 2 books *Memorabilia*; elementary composition			
187[illegible]	OHIO STATE UNIVERSITY	Elementary Rhetoric and Composition.	Arithmetic	Through Quadratics	Plane, solid, and spherical Geometry and Plane Trigonometry	U. S. History General History Physical Geography	Cæsar, 3 books; Vergil, 5 books; Cicero, 5 orations; grammar and composition			Physics, Botany	
1868	CORNELL UNIVERSITY.	Grammar, short composition taken, if desired, from one of the following works: *Merchant of Venice*, *Lady of the Lake*, *Twice-Told Tales*, *Vision of Sir Launfal*	Including Metric system	Through Quadratics, Radicals, and Exponents	Plane Geometry, 5 books of Chauvenet's Elements of Geometry, or 5 books Wentworth's P. and S., or [illegible] books Newcomb's Elements or 5 books H. Smith's Elements of Geometry	Political and Physical Geography.	*Gallic War*, 4 books; *Eclogues* and 6 books of *Æneid*; 6 orations of Cicero; Prosody; Latin at sight; Latin composition	[illegible] pages Attic prose and 3 books of Homer; easy Greek at sight, and Greek composition	Greek and Roman History and Geography	Elementary Physiology	
1867	JOHNS HOPKINS UNIVERSITY	English Grammar and Composition; outlines of the History of English Language; short composition	Including Metric system	As in Todhunter's chapters	Plane and Solid Geometry; Plane Trigonometry; Analytic Geometry.	Physical and Political Geography U. S. History and English History, or Ancient History	[illegible] War, [illegible] books; *Eclogues* and 6 books *Æneid*; [illegible] orations; Latin at sight; composition; grammar and prosody	*Anabasis*, 4 books; [illegible] 5th book [illegible] prose composition (Elective with German and French)	Greek and Roman History [illegible] with United States and English History	Elementary Physics, Chemistry, Botany, Physiology	German and French. Elements of one and more advanced work in either (Elective with Greek)
1869	BOSTON UNIVERSITY	Short composition on subject taken from one of the following works: *Macbeth*, *Julius Cæsar*, *Paradise Lost* I-II, *Tale of Two Cities*, [illegible] *Rape of the Lock*, *Sir Launfal*, *She Stoops to Conquer*	Including Metric system	Including Quadratics, Radicals, and Binomial Theorem	Plane Geometry		[illegible] War, 4 books; [illegible] Cicero [illegible] Vergil [illegible] composition; grammar [illegible]	*Anabasis*, 4 books; sight reading [illegible] Homer [illegible] composition	Greek History to the death of Alexander; Roman History to the death of M. Aurelius; Ancient Geography	Elementary Physics, as in Stewart's *Primer*	Sight translation of easy French prose
1873	VANDERBILT UNIVERSITY.	Grammar and Analysis Short composition on subject taken from the following works: *Lady of the Lake*, *Merchant of Venice*, *Tom Brown at Rugby*, *Lamb's Tales from Shakespeare*	Including Metric system	Including Quadratics, Radicals, Binomial Theorem, Logarithms.	[illegible] books [illegible]	U. S. History Geography	Grammar; Cæsar, [illegible] books; Vergil, [illegible] books; [illegible] prose composition	[illegible] Syntax; prose composition; *Anabasis*, [illegible] books; *Iliad*, 2 books			

CHANGES PROPOSED IN THE CURRICULA OF THE VARIOUS COLLEGES AT BERKELEY.

A committee of the Faculties at Berkeley has been in session twice weekly during the past six months, with the object of recommending for the adoption of the various Faculties some changes in the present scheme of lectures and tuition. These will be submitted at the proper time to the Faculties, and if approved by them will be recommended to the Board of Regents. I, however, consider these changes to be so important that I desire to introduce here a scheme exhibiting their *general* nature, although the Faculties may make important alterations. This scheme, together with the principles which have guided the committee in its action, are given below:

In proposing the following scheme of studies for the various Courses for the consideration of the Faculties, the committee endeavored to work to the following principles:

1. The formation of a justly balanced whole in the curriculum of each Course is the vital matter. The total time assigned to each department should be determined by its relative importance in such a whole.
2. The claims of the various departments to the time of the student are estimated by means of the number of hours per week laid down in the curriculum.
3. The plan of three hour courses has been adopted as the one which adjusts itself best to the time schedule of recitations and lectures.
4. The particular way in which the time so assigned is to be used is, in general, left to the heads of the departments.
5. For each hour per week laid down in the curriculum the officer of instruction may require two hours of preparation from the student but no more.
6. But the hours laid down for work in the laboratories and for field practice do not imply any time for preparation.
7. It is regarded as essential that Physics shall be prescribed and that it shall be studied as early as possible, both in the form of lecture room exercises and with experimental work by the students themselves.

Setting out from the foregoing principles the committee has reached at the present time the development of the various curricula, which is exhibited in the accompanying tables, in which, however, I have myself made slight changes:

FRESHMAN YEAR.

SUBJECT.	COLLEGE OR COURSE AND TERM.																							
	Classical.		Literary.		L. and P.		Mech.		Mining.		Civ. E.		Agric're.		Chem.		Biology.		Math'ics.		Physics.		Geology.	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
English History	----	----	----	----	3	3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Greek	3	3	----	----	(3)	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Latin	3	3	3	3	3	3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
English and Themes	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
German	(3)	(3)	3	3	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	3	3	3	3	(3)	(3)
French	(3)	(3)	3	3	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	3	3	3	3	(3)	(3)
Mathematics	3	3	3	3	3	3	5	5	5	5	5	5	3	3	3	3	3	3	5	5	5	5	3	3
Précis Writing	----	----	----	----	----	----	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Elementary Chemistry	----	----	----	----	----	----	3	----	3	----	3	----	3	2	3	----	3	----	----	----	----	----	3	----
Botany (only one hour of preparation required)	----	----	----	----	----	----	----	----	----	----	----	----	2	2	2	2	2	2	----	----	----	----	2	2
Free-hand Drawing	(3)	(3)	(3)	(3)	(3)	(3)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Shop Work	----	----	----	----	----	----	3	3	3	(3)	3	3	3	(3)	3	(3)	3	(3)	3	3	3	3	3	(3)
Qualitative Analysis	----	----	----	----	----	----	----	9	----	9	----	9	----	9	----	9	----	9	----	----	----	(9)	----	9
Blowpipe Analysis	----	----	----	----	----	----	----	----	----	(3)	----	----	----	(3)	----	3	----	(3)	----	----	----	(3)	----	(3)
Botanical Laboratory	----	----	----	----	----	----	----	----	----	----	----	----	3	3	3	3	3	3	----	----	----	----	3	3
Exercises in French	(1)	(1)	1	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1	1	1	1	(1)	(1)
Exercises in German	(1)	(1)	1	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1	1	1	1	(1)	(1)
Military Exercises	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Totals	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Parentheses indicate hours that are elective in the courses where they occur.

SOPHOMORE YEAR.

Subject.	College or Course and Term.																							
	Classical.		Literary.		L. and P.		Mech.		Mining.		Civ. E.		Agric're.		Chem.		Biology.		Math'ics.		Physics.		Geology.	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
General History					3	3																		
Greek	3	3			(3)	(3)																		
Latin	3	3	3	3	3	(3)																		
English and Themes	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
German	(3)	(3)	3	3	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	3	3	3	3	(3)	(3)
French	(3)	(3)	3	3	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	3	3	3	3	(3)	(3)
Mathematics	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Physics	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
United States History, I						3																		
Inorganic Chemistry							2	2	2	2	2	2	2	2	2	2	2	2					2	2
Surveying							2	2	2	2	2	2												
Mathematics (Calculus)																			2	2	2	2		
Biology																	3	3						
Physical Laboratory	3	3	3	3	3	3							3	3	3	3	3	3	3	3	3	3	3	3
Quantitative Chemical Laboratory									(15)	(15)			15	15	15	15							15	15
Field Practice							6	6	(6)	(6)	6	6												
Mapping							3	3	(3)	(3)	3	3												
Descriptive Geometry and Drawing							4	4	4	4	4	4							4	4	4	4		
Shop Work																								
Biological Laboratory																	6	6						
Exercises in French	(1)	(1)	1	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1	1	1	1	(1)	(1)
Exercises in German	(1)	(1)	1	1	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1	1	1	1	(1)	(1)
Military Exercises	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Totals																								

JUNIOR YEAR.

SUBJECT.	COLLEGE OR COURSE AND TERM.																							
	Classical.		Literary.		L. and P.		Mech.		Mining.		Civ. E.		Agric're.		Chem.		Biology.		Math'ics.		Physics.		Geology.	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
Philosophy	3	3	3	3	3	3	----	----	----	----	----	----	----	----	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Roman Law	----	----	----	----	3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
United States History, II	----	----	----	----	3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Greek	(3)	(3)	----	----	(3)	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Latin	(3)	(3)	(3)	(3)	(3)	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
English and Themes	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
English (elective)	(3)	(3)	(3)	(3)	(3)	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
German	(3)	(3)	(3)	(3)	(3)	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
French	(3)	(3)	(3)	(3)	(3)	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Mathematics, I	(3)	(3)	(3)	(3)	(3)	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Mathematics, II	(2)	(2)	(2)	(2)	(2)	(2)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Special Course in History	3	3	3	3	----	----	----	----	----	----	----	----	----	----	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Zoölogy	(2)	(2)	(2)	(2)	(2)	(2)	----	----	----	----	----	----	2	2	----	----	2	2	(2)	(2)	(2)	(2)	2	2
Elementary Chemistry (with Lab.)	(3)	----	(3)	----	(3)	----	----	----	----	----	----	----	----	----	----	----	----	----	(3)	----	(3)	----	----	----
Physical Problems (with Lab.)	(1)	----	(1)	----	(1)	----	1	----	1	----	1	----	----	----	----	----	----	----	1	----	1	----	1	----
Elementary Political Economy	----	3	----	3	----	3	----	3	----	3	----	3	----	3	----	3	----	3	----	3	----	3	----	3
United States History, III	----	----	----	----	----	3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Analytic Mechanics, I	----	----	----	----	----	----	4	4	4	4	4	4	----	----	----	----	----	----	4	4	4	4	----	----
Analytic Mechanics, II	----	----	----	----	----	----	2	2	----	----	----	----	----	----	----	----	----	----	(2)	(2)	2	2	----	----
Differential Equations	----	----	----	----	----	----	2	----	2	----	2	----	----	----	----	----	----	----	2	2	2	2	----	----
Least Squares	----	----	----	----	----	----	1	----	1	----	1	----	----	----	----	----	----	----	1	----	1	----	----	----
Strength of Materials	----	----	----	----	----	----	----	4	----	4	----	4	----	----	----	----	----	----	----	----	----	----	----	----
Mineralogy	----	----	----	----	----	----	----	----	4	2	4	2	2	----	2	----	----	----	----	----	----	----	4	2
Surveying	----	----	----	----	----	----	----	----	----	----	----	----	2	2	----	----	----	----	----	----	----	----	2	2
Agricult. Chemistry	----	----	----	----	----	----	----	----	----	----	----	----	3	3	3	3	----	----	----	----	----	----	----	----
Organic Chemistry	----	----	----	----	----	----	----	----	----	----	----	----	2	2	2	2	(2)	(2)	----	----	----	----	----	----
Theoretical Crystallography	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	(2)	----
Biology, I	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	----	----	----	----	----	----	----
Biology, II	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	3	----	----	----	----	----	----
Quaternions	(2)	(2)	(2)	(2)	(2)	(2)	----	----	----	----	----	----	----	----	----	----	----	----	2	2	(2)	(2)	----	----
Chemical Philosophy	(2)	(2)	(2)	(2)	(2)	(2)	----	----	----	----	----	----	----	----	2	2	(2)	(2)	(2)	(2)	(2)	(2)	----	----

JUNIOR YEAR—Continued.

SUBJECT.	COLLEGE OR COURSE AND TERM.																							
	Classical.		Literary.		L. and P.		Mech.		Mining.		Civ. Eng.		Agric're.		Chem.		Biology		Math'ics.		Physics.		Geology.	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
Qualitative Analysis (see above)		(9)		(9)		(9)														9		9		
Physical Laboratory (see above)	(3)	(6)	(3)	(6)	(3)	(6)	3	6	3	6	3	6							3	6	3	6	3	6
Graphical Statics							3		3		3													
Drawing							6	6	6	6	6	6												
Agricultural Chemical Laboratory													6	6										
Biological Laboratory																	6	6						
Shop work																								
Quantitative Analysis															9	6								
Field Practice													6	6									6	6
Mapping													3	3									3	3
Crystallographic Laboratory																								(6)
Organic Chemical Laboratory															6	6	6	6						
Military Exercises	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

SENIOR YEAR.

SUBJECT.	College or Course and Term.																							
	Classical.		Literary.		L. and P.		Mech.		Mining.		Civ. E.		Agric're.		Chem.		Biology.		Math'ics.		Physics.		Geology.	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
Mathematics, III																			3	3	(3)	(3)		
Mathematics, IV																			2	2	(2)	(2)		
Spanish	(3)	(3)	(3)	(3)	(3)	(3)									(3)	(3)			(3)	(3)	(3)	(3)	(3)	(3)
Ethics, first term; Civil Polity, second term	(2)	(2)	(2)	(2)	(2)	(2)																		
Philosophy, I	(2)	(2)	(2)	(2)	(2)	(2)													(2)	(2)	(2)	(2)	(2)	(2)
Philosophy, II	(2)	(2)	(2)	(2)	(2)	(2)													(2)	(2)	(2)	(2)	(2)	(2)
Comp. Const. History	(3)		(3)		3																			
Economic Thought	(3)		(3)		3																			
Political Theories		(3)		(3)		3																		
United States Constitution		(3)		(3)		(3)																		
Linguistics, first term; Comp. Phil., second term	(2)	(2)	(2)	(2)	(2)	(2)																		
Greek, I	(2)	(2)			(2)	(2)																		
Greek, II	(2)	(2)			(2)	(2)																		
Latin, I	(2)	(2)	(2)	(2)	(2)	(2)																		
Latin, II		(2)		(2)		(2)																		
Roman Literature	(2)		(2)		(2)																			
English and Themes	2	(2)	2	(2)	2	(2)													(2)	(2)	(2)	(2)	(2)	(2)
English (elective)	(2)	(2)	(2)	(2)	(2)	(2)													(2)	(2)	(2)	(2)	(2)	(2)
German	(2)	(2)	(2)	(2)	(2)	(2)													(2)	(2)	(2)	(2)	(2)	(2)
French	(2)	(2)	(2)	(2)	(2)	(2)													(2)	(2)	(2)	(2)	(2)	(2)
Mathematics, I	(2)	(2)	(2)	(2)	(2)	(2)															(2)	(2)		
Mathematics, II	(2)	(2)	(2)	(2)	(2)	(2)															(2)	(2)		
Geology	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	3	3	3	3	3	3	3	3	3	3	(3)	(3)	3	3	3	3
Astronomy	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)			3	3	3	3	(3)	(3)	3	3	3	3	3	3	(3)	(3)
Civil Engineering											3	3												
Hydraulics							4	2	4	2	4										4	2		
Mining									3	3														
Metallurgy									3	3													3	3
Kinematics							2	2											2	2	2	2		
Thermodynamics							2	4											(2)	(4)	2	4		
Sanitary Engineering											(2)													

SENIOR YEAR—Continued.

SUBJECT.	COLLEGE OR COURSE AND TERM.																							
	Classical.		Literary.		L. and P.		Mech.		Mining.		Civ. E.		Agric're.		Chem.		Biology.		Math'ics.		Physics.		Geology.	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
Specifications and Contracts										2		2		2										
Higher Surveying and Geodesy												2												
Agriculture and Horticulture													3	3										
Phys. Chemistry													2		2		2							
Petrography									(2)						(2)								2	
Entomology													2	2										
Econ. Geology																3								3
Paleontology	(2)		(2)		(2)										(2)		2						2	
Biology, I																		3						
Biology, II																	3	3						
Meteorology	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1	1	1	1	1	1	(1)	(1)	1	1	1	1
Theory of Vision	(1)	(1)	(1)	(1)	(1)	(1)													(1)	(1)	1	1		
Field Work in Agric're every other Saturday													5	5										
Field Work in Horticulture														3										
Assaying									6	6					(6)	(6)							6	6
Mechan. Laboratory							8	8	(6)	(6)														
Engineering Drawing							9	9	(6)	(6)	6	6												
Observatory	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)			6	6							(6)	(6)	(6)	(6)	(6)	(6)
Phys. Laboratory, special work							(6)	(6)	(6)	(6)									(6)	(6)	6	6	(6)	(6)
Biol. Laboratory																	6	9						
Geol. Excursions, four times per year	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1	1	1	1	1	1	1	1	1	1	(1)	(1)	1	1	1	1
Metall. Laboratory										(6)														
Petrograph. Laboratory										(6)						(6)								6
Quantitative Analysis (Assaying *elective*)															12	9								
Mineral. Laboratory									4	4	4	4			4	4							4	4
Shop Work																								
Agric. Laboratory													6	6										
Phys.-Chem. Laboratory													6		6		6							
Entomol. Laboratory														3										
Paleontol. Laboratory																(6)		6						6
Military Exercises	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

AFFILIATED SCHOOLS OF DIVINITY.

In the organic Act by which the University is formed, it is expressly provided that "no sectarian, political, or partisan test shall ever be allowed or exercised in the appointment of Regents, or in the election of professors, teachers, or other officers of the University, or in the admission of students thereto, or for any purpose whatsoever. Nor, at any time, shall the majority of the Board of Regents be of any one religious sect, or of no religious sect; and persons of every religious denomination, or of no religious denomination, shall be equally eligible to all offices, appointments, and scholarships." But it is also provided that any incorporated College of Law, of Medicine, or the like—even that "any special course of instruction"—may be affiliated with the University, upon terms to be agreed upon by the Regents and the authorities of such college or course. "And such college (or colleges) so affiliated shall retain the control of their own property, with their own Boards of Trustees, and their own Faculties and Presidents, and the students of those colleges shall receive from the University the degrees of those colleges." Under these wide provisions the Colleges of Law, Medicine, Dentistry and Pharmacy have been successively affiliated with the University. They have their own perfectly independent Faculties, which prescribe the course of study within the college, and which recommend to the Regents the candidates for degrees. The Regents can grant no collegiate degrees without such recommendation. The intentions of a founder of any such college are carried out in the most loyal manner, and they will ever be so carried out.

"A special course of instruction" can be added to the University in the same manner, with the same assurance, and under the same safeguards. One such special course has already been added by the gift of $75,000 from D. O. Mills, Esq., who has established the Professorship of Intellectual and Moral Philosophy and Civil Polity.

There is every reason to hope that other such colleges and other such special courses will be added to the University in the future.

The absence of specific instruction in Theology and Divinity in the University, is deplored by many far-seeing and liberal men, who would be glad to see their sons and the sons of their fellow-citizens provided with the means of study in all the branches of a religious training.

It appears to me that the remedy for this is not far to seek. I do not see why Colleges of Divinity and of Theology may not be established at Berkeley, or at any place that their founders may think wise. Every safeguard is provided by the law that the intentions of such founders shall be loyally carried out. Either on the beautiful grounds of the University, or near them, such colleges could be erected. Faculties of learned Divines could be chosen, and any desired curriculum could be prescribed. Such of the courses in the colleges already established at Berkeley as might be useful, could be attended by their students. Specific theological training, and all the accessories of a life devoted to purely religious deeds could be provided.

Nothing but good could come of such a union. The effect of such a school as this, near our present colleges, would be to direct the attention of *all* our students in the right way. On the other hand, the Faculty of such a Divinity School would find its hands strengthened by the presence of a large body of earnest students, both professors and scholars.

There is no reason why more than one such school should not be founded. Harvard College is associated with two at the present time. What is to prevent the founding at Berkeley of a School of Divinity, which shall be under the direction of any special church?

It appears to me that this is a subject well worth the attention of the friends of religion and of learning. If a whole college can not be at once provided, certainly "a special course or courses of instruction" can be.

GRADUATE DEPARTMENT.

Higher Degrees.

The higher degrees of the University are the Master's degrees, which are properly *college* degrees, and which are given by the Regents on the recommendation of the various college Faculties; and Ph.D. and Sc.D., which are truly University degrees, and are to be granted by the Regents on the recommendation of the Academic Senate. None of these higher degrees are given *in absentia*. We have at present eleven graduate students, six of whom are candidates for higher degrees.

UNIVERSITY PUBLICATIONS.

The following publications, giving information concerning the University and its various departments, may be obtained by addressing the Recorder, the Secretary, or one of the Deans:

1. The University Register.
2. The Circular of the Colleges of Letters and Science, containing specimen entrance examination papers and information concerning the requirements for admission.
3. The Annual Announcement of Courses of Instruction.
4. The Biennial Report by the President for the Board of Regents.
5. The Annual Report of the Secretary.
6. The Report of the Professor of Agriculture.
7. The Agricultural Bulletins.
8. Various University Bulletins on special subjects.
9. The Annual Announcement of the College of Medicine.
10. The Annual Announcement of the College of Dentistry.
11. The Annual Announcement of the College of Pharmacy.

It is probable that some changes in the matter of our publications can be made, and that a saving in their cost can be effected.

LECTURES.

One of the simplest ways to encourage the University idea is to provide, from time to time, lecturers upon special subjects. Such temporary professors were provided for in the *Organic Act* of the University; and as fast as money is available for the purpose, it appears to me that this excellent idea should be carried out in a systematic manner. The means by which it might be extended can best be indicated by a few practical suggestions. For example, it appears to me that a series of lectures on the theory and practice of railway management and organization might well be given. There is no subject more important than this in practical affairs, and the best intellect is now employed in this profession, as it formerly was in the profession of war. It would seem to be possible to teach at Berkeley to the students of some of the technical colleges the general principles of the *management of railways*, leaving the details to be learned by actual practice.

Journalism is becoming a profession, and it is one in which sound knowledge is really essential if the daily press is to elevate and not to debase the community. Our course in Letters and Political Science is an admirable preparation for this profession, but it requires to be supplemented by a few special lectures.

A series of lectures by suitable persons upon *commerce* is imperatively needed. A concrete example will illustrate this. A single journey on the west coast of South America will show that the United States, the nearest neighbor of these countries, is practically left out of their material advancement. The causes of this exclusion are most instructive, but they need not operate always. It is eminently proper that these causes should be exhibited to our future citizens.

A course of lectures upon the *administration and management of cities* should by all means be instituted. The best administration of this class, as well as the worst, exists in our own country. A study of the annual reports of the Commissioners of the District of Columbia would be most important in this regard. Washington is now the best governed city in the world.

A series of lectures on the statistics gathered at the last census would be of immense value. How has our population increased during successive decades, and why has it increased as it has done? The census volumes on *manufactures*, *agriculture*, *transportation*, *newspapers*, *taxation*, *forestry*, to speak of no others, contain vast amounts of real information which should be sifted and clearly presented. And so with many other topics.

PRACTICAL INSTRUCTION IN MECHANICAL ENGINEERING IN THE WORKSHOP.

It appears to me to be of importance that the Mechanical Engineering Department should be strengthened by the addition of a workshop in which the Freshman Classes of all the scientific colleges can receive practical instruction in the simpler forms of mechanical work.

I have consulted fully with Professor Hesse and others in regard to this, and we shall probably attempt this work during the next year, if especial facilities can be furnished.

The present workshops are arranged for fine work and they are occupied by the older students. They are not suitable for elementary instruction. It is my opinion that every student in the scientific departments should have at least one year of practical shop work, which is obligatory. If at the end of this year he should find it desirable to go on in the same way, the present shops will offer him admirable facilities for doing so. Both Professor Hesse and myself are of opinion that the third floor of the Building of Mechanic Arts cannot be used for placing the necessary machinery on account of the weakness of the flooring. The two rooms—shops—on the first floor were fitted for machinery with extra strong flooring, yet these proved to be too weak on account of the vibrations, and extra foundation walls had to be provided there. The upper rooms might, however, be used for carpentry and bench work, provided skylights are put in place of the present small windows. I have had an estimate made for these skylights, and they would cost about $1,500.

After careful consideration I am of the opinion that the most economical way to carry out this plan would be to build a small building, 28x90 feet, specially for the purpose; the building to be situated back of the College of Mechanic Arts, and to cost not to exceed $3,500. To fit this building for instruction in carpentry, with the proper tools and benches, will cost about $2,000. To fit it for the proper working in metal, including tools, will cost about $5,000. To fit it for instruction in blacksmithing and forging will cost about $400. Miscellaneous furniture, cases, shelves, apparatus for blue-printing, etc., will cost about $400; total, $11,300. It will accommodate about thirty to forty students at a time. If this plan is carried out, as it should be, all our Engineering Colleges will become even more valuable and important to the State than they now are.

SHORT COURSE IN PRACTICAL AGRICULTURE.

I am now consulting with Professor Hilgard to see if it is not possible to establish at Berkeley, in addition to the long course in Agriculture, a short course, which shall be available to those students who have not the time to devote to the very thorough and complete long course. We are now offering great facilities to *special students* for the study of Agriculture and Viticulture, and this class of students will undoubtedly increase in numbers as time goes on. It seems to me, however, to be desirable to fully organize a short course in Agriculture, and to make it widely known throughout the State, so that it need not be left for the student himself to select those parts of the course which he can afford time to take, but that this selection may be judiciously made for him by his professors.

At the proper time the Faculty of the College of Agriculture will lay before the Board of Regents the programme of such a short course, and ask for its adoption. In the meantime I have felt it to be my duty to report this, and to ask for support in this important matter.

PROPOSAL FROM ADOLPH SUTRO, ESQ.

I have the honor to present herewith a letter from Adolph Sutro, Esq., in which he makes a very liberal offer to the University, namely, to present to it six acres of land in immediate proximity to the site which he has chosen for his magnificent library (which will contain 500,000 books on scientific subjects only), and to the sites of his botanical and other gardens, his two aquariums, etc. Mr. Sutro makes only one condition—namely, that a building to cost $10,000 shall be erected within a year on this site.

This liberal gift can only be accepted by asking the Legislature to furnish the building for us, and to improve the grounds. It appears to me, that two of the professional colleges are directly interested here, namely, the Colleges of Medicine and of Dentistry, which will profit by practical instruction in Biology. This site is an ideal one for a seaside biological laboratory, where scientific research shall be carried on, and Mr. Sutro will provide and will support the best aquariums in the world. These are now partly built. The site adjoins splendid gardens in which facilities are offered for experiments in botany and agriculture. The library of Mr. Sutro will be, in itself, half of a University, and access to it is equally important to all the Colleges of the University. The site proposed is at the terminus of two cable roads, and will be less than one hour distant from the City Hall.

Actual teaching must be done elsewhere, I presume, but there is no better station in the world for real research. I need only speak of the similar stations of Naples, and of the Johns Hopkins University, on Chesapeake Bay, to show how much may come from such an establishment.

Mr. Sutro's letter, received May 25, 1886, follows:

SUTRO HEIGHTS, SAN FRANCISCO, CALIFORNIA.

President EDWARD S. HOLDEN, *University of California, Berkeley, California:*

MY DEAR SIR: During your visit a suggestion was discussed of locating a branch of the University near Sutro Heights in the vicinity of the Library and Aquarium which I intend to establish at or near that place. I now wish to state more definitely that I will donate to the University of California a block of land overlooking the ocean east of Sutro Heights, two hundred and forty by six hundred feet (containing six or seven acres), provided the University will erect thereon buildings costing not less than $10,000, within one year from this date.

This will give you a title, and if you intend to put up additional improvements, you can do so at any time that the means at your command will permit.

Hoping that this plan may be carried out, in the interest of scientific investigation, I am,

Very truly yours,

[*Copy.*] ADOLPH SUTRO.

An extract from a letter of Professor W. R. BROOKS, of the Johns Hopkins University, to Professor JOSEPH LE CONTE, follows:

> I am sorry that I am able to give you little advice regarding the availability of the proposed site for a marine laboratory, but no opinion which is not based on personal examination can be of much value. So far as I can judge from the chart, the Bay of San Francisco is an excellent locality for research in marine zoology; and while it is, of course, desirable that a marine laboratory should be near the water, it has been found best in practice to supply marine aquaria with aerated water from storage tanks, rather than directly from the ocean. This water can be used for many months, and I have kept sea water in good condition for more than a year. The uniform temperature and absence of sediment, and of the spores of *algæ*, which are thus secured, are so desirable that the Naples and Brighton aquaria are supplied in this way, though both are close to the water. * * * Proximity to a good harbor is very essential, and I should hesitate to advise the selection of a site without this advantage. * * * The most important feature of marine zoological research is the study of the surface fauna, and the best localities for this work are deep sheltered bays with little fresh water. If the water of the Bay of San Francisco is not brackish, it must be an excellent place for surface collecting, and I should think it might be possible to find a locality which would do for the general biological laboratory of the University, and for research in marine zoology also. Much expense and time could thus be saved for one outfit, and one building would serve both purposes.
>
> [*Copy.*]

BANCROFT LIBRARY.

I wish to bring to the attention of your Excellency the fact that Mr. H. H. BANCROFT is preparing to dispose of his library of documents relating to the history of the west coast of America, and of rare manuscripts relating to the same subject. This library contains forty thousand volumes, relating to the Pacific Coast; has taken many years to collect, and the cost of it is stated at over $250,000. I am informed that it is held at that price.

It appears to be very important that this unique collection should not leave the State of California. If it is possible, it should be kept at the University; if not, still it should remain within the State. At all events, it should not be allowed to be sold at auction. It owes its value chiefly to its completeness. I hope that some suggestion for bringing about this desirable end may be made at the proper time. I venture to quote a paragraph from a weekly paper on the subject:

> Mr. H. H. BANCROFT will soon finish his great series of historical works, and then it is understood that the library, whose wealth of material has given such a solid basis to the histories, will be sold. The value of this library to California cannot be even faintly realized, from the bare statement that it contains thirty thousand volumes relating to the Pacific Coast. Its peculiar importance lies in the fact that it can never be duplicated. To a considerable extent its books have been compiled expressly for it. There are hundreds of volumes of stenographic interviews with old Californians, containing their recollections of our early history. There is an invaluable abstract of the California archives, extending to about ninety volumes. Everything that has been written, printed, or said about the Pacific Coast has been collected if it could possibly be obtained, and trouble or expense

has never been considered. And the thing that distinguishes this storehouse of knowledge from almost all other libraries in the world, is the way in which its treasures are made available. The whole collection is indexed as if it were a single book. This advantage of course will be lost if the library shall be scattered. One of two things must happen: either enough public spirit must be found to retain this institution, which is less a mere library than a living organism, in San Francisco, or we must see it mutilated, its parts dispersed throughout the world, its value in great measure destroyed, and this city humiliated in the eyes of lovers of knowledge. If it is put on sale in New York, the Library of Congress will buy part, the British Museum part, and the rest will be scattered in useless scraps. The important thing is that it shall remain an undivided whole.

CONFERENCE ON THE SUBJECTS OF ENGLISH AND MATHEMATICS, BETWEEN THE TEACHERS OF CALIFORNIA AND THE OFFICERS OF THE UNIVERSITY.

At a meeting of the Board of Regents on the second of March, 1886, the President was authorized to invite the teachers of English and Mathematics and the principals of the various public and private schools of the State to a conference at Berkeley on the subjects of English and Mathematics.

In accordance with this permission invitations were issued on the eighteenth of March for a conference on the twenty-fourth of April. About two hundred teachers accepted this invitation, and letters from many others signified their appreciation of our efforts. I have every reason to believe that this meeting has been productive of good results, not only directly, but indirectly.

It was the opinion of those assembled at this conference that similar meetings in the future would be of great importance, and it was advised that the next meeting should take place in November, 1886.

CHEMICAL LABORATORY.

For some time past the chemical laboratories have been inadequate for the purposes of the University. The course in chemistry requires far more room than we have at present, and the rooms are not sufficiently ventilated. They should be moved from the south hall, into a building especially arranged for the laboratories of the departments of chemistry and of agriculture, and for the department of biology, which it is hoped to found.

Detailed plans of such a building are now preparing, and will be submitted at the proper time. A specific appropriation of $———, will be imperatively needed, for this purpose. When this building is erected, the University will not need to ask the Legislature for any new building, except a new museum, for a long time to come. The departments can be assigned to new rooms in the present buildings and every requirement fulfilled.

COST OF CHEMICAL LABORATORIES.

Prof. Rising has furnished me with the following statistics of the cost of the chemical laboratories, at various European Universities:

New Laboratory at Buda-Pesth	675,000 francs,	$128,250 00
At Aix-la-Chapelle	1,565,000 francs,	297,350 00
At Bonn	460,000 francs,	87,400 00
At Berlin	1,193,000 francs,	226,670 00
At Gratz	825,000 francs,	156,750 00
At Munich	690,000 francs,	131,100 00
At Geneva	950,000 francs,	180,500 00

AID TO NEEDY STUDENTS.

We are often asked what scholarships are available to undergraduates at Berkeley. At the present time there are none such. Tuition in the University is absolutely free to all, which amounts to saying that every student is the holder of a scholarship, yielding from $100 to $150 per year. With tuition absolutely free, I personally am not in favor of the establishment of an extensive series of endowed undergraduate scholarships. A few such, yielding say $200 a year each, might be very useful, if it were to be distinctly understood that there was no obligation on the part of the authorities to bestow all of them each year, irrespective of circumstances.

There are many things of more value than a "college education," and the habit of depending upon himself for his advantages should be early fixed in the nature of every American lad. It is a melancholy thing to me to see the habit of sturdy self-reliance broken up in a generous youth, and to find as a substitute for it a vague and baseless belief that some one not himself is, in some manner not sharply defined, going to see to it that he is provided for. At Harvard University, which has more undergraduate scholarships than any other college, the benefit to the holder of one is about $200 on the average. The tuition fees of $150 per year must be paid from this, in all cases. Scholarships at Harvard thus amount on the whole to free tuition and to little more.

Our tuition is absolutely free, and laboratory dues are remitted to needy students. I do not see that we are called upon to do more than this. We have been in the habit of employing students to do all the miscellaneous work in the University which they were capable of performing. For example, during the fiscal year 1884–5 the amount paid students in this manner was $2,246 61. During this year there were 241 students in the University (at Berkeley only). See table following, which has been kindly compiled for me by the Secretary:

STATEMENT OF AMOUNTS PAID STUDENTS FOR WORK DONE AT THE UNIVERSITY, DURING THE FISCAL YEAR ENDING JUNE 30, 1885.

Paid Armourer	$144 00
Paid 2 janitors (students), in the Library	720 00
Paid student, assistant to Prof. John Le Conte	250 00
Paid 2 students, for work in the land administration department	112 87
Paid 2 students, for surveying	286 00
Paid 2 students, in the agricultural department, for services rendered	58 12
Incidental payments, to 3 students	12 70
Paid students, for work rendered in the Printing Office of the University	380 42
Fees remitted in the Chemical Laboratory, for services rendered	277 50
Fees remitted in the Physical Laboratory, for services rendered	5 00
Fees remitted in the Metallurgical Laboratory	------
Total	$2,246 61

The graduates of the Class of 1886 have formed a *Students' Loan Fund*, by their own subscriptions. Out of this fund, they propose to lend to needy undergraduates, small sums, to be repaid after graduation.

LE CONTE MEMORIAL FELLOWSHIPS OF THE ALUMNI ASSOCIATION OF THE UNIVERSITY OF CALIFORNIA.

The LE CONTE Memorial Fellowship Fund is founded and endowed by the members of the Alumni Association of the University of California, to be a worthy expression of their esteem, admiration, and affection for their two honored Professors, JOHN and JOSEPH LE CONTE.

The fund for the endowment of the LE CONTE Fellowships is to be raised from the voluntary contributions of the Alumni of the University of California, and of all others who may contribute thereto. It is intended that this fund shall be a perpetually growing one, to be augmented from the sources indicated, and that its enlargement shall forever remain an object of primary interest to every Alumnus of the University of California.

The fund is not to be available until the income derived shall have reached $500 per annum.

The fund is to be devoted exclusively to the support of one or more Fellows, who shall reside at the University of California or elsewhere, as the Board of Administration shall direct.

Any person may present himself as a candidate who may have graduated from the University of California within three years of the awarding of the Fellowship, and who may have announced his intention to devote his entire time for one or more years to the advanced study of one branch, or several intimately connected branches of knowledge, under the direction of a regularly organized University Faculty.

The sole tests for selection from among candidates for the LE CONTE Fellowships shall be superior excellence, as determined at its discretion by the Board of Administration.

Each Fellowship shall, for the present, be worth five hundred ($500) dollars per annum.

PRIZE OFFERED BY THE HARVARD CLUB OF SAN FRANCISCO IN 1887.

I give below a copy of a letter from FRANK J. SYMMES, Esq., President of the Harvard Club of San Francisco, which is self explanatory:

THE HARVARD CLUB OF SAN FRANCISCO,
SAN FRANCISCO, CALIFORNIA, June 24, 1886.

DEAR SIR: At its last quarterly meeting, the Harvard Club of San Francisco voted to devote a portion of its funds to the use of California students in post-graduate study at Harvard College.

We have, therefore, the pleasure of announcing to you that at the end of the coming academic year, the Harvard Club of San Francisco will award a present of not less than $200 to such graduate of the University of California as may be recommended to the Club by your Academic Council; the same award to be used by the recipient in the pursuit of post-graduate study at Harvard College. The desire of the Club is to encourage, and, in a measure, to reward faithful devotion to study in our own University, and to aid in extending to California students, if possessed of talent, the advantages of the Graduate Courses of Harvard University.

If the proposal meets with your approval, we should be glad to have you make an announcement of it to the class of 1887; and to confer with you as to the details of a plan for awarding the prize.

Yours truly,

FRANK J. SYMMES, President.

To President EDWARD S. HOLDEN, University of California, Berkeley.

[*Copy.*]

This offer has been accepted by the Board of Regents, with thanks.

GOVERNMENT EXPERIMENT STATIONS.

It is well known that a bill is before Congress for the establishment of Government experiment stations in the various States, and thus for the establishment of one at Berkeley. The importance of such action to the agricultural interests of California is well set forth in an article in the *Pacific Rural Press* of April 10, 1886, from which I copy what follows:

To demonstrate fully the advantages to be derived from the establishment in all parts of the country of stations for local experimentation, one would have to inquire carefully into the conditions affecting agriculture at present, and mark the changes which have occurred in them during the last generation. This would exceed space which we can command at this time. Suffice it to say that old things are passing away and all things are becoming new. Agriculture feels new needs as it endeavors to meet the new requirements made upon it. Each man feels that he must do new things, or do old things in a new way. He is hedged about by the rapid growth and progress of other industries. Some of them by government aid, others by the force of their easily associated capital and effort, are moving forward in all directions, commanding the world's markets and multiplying products as was not dreamed of a quarter of a century ago. Agriculture cannot, because of the isolated condition of her votaries and widely distributed means, help herself forward as do the other industries, and it clearly devolves upon the General Government to foster and promote the interest which lies at the very foundation of national prosperity.

This work has been well begun. The Department of Agriculture at Washington was never so well equipped as now, and never so well managed to meet the wants of the great producing interest. But it seems to us that now there is a special need, and that is the establishment of intimate bonds of union between the central department and the agriculture of the different commonwealths. This is necessary to enable the Government to do its best work so as to meet the needs of the widely different sections of the country. Fortunately the Government has already the channels provided for making this important connection and localizing, so to speak, the efforts of the department in every State in the Union. These channels are the agricultural colleges. There has been, as is well known, some disappointment in the public mind as to the practical working of these institutions. As a rule, students in agriculture have been few. There may be different ideas as to the causes of this fact; it is not necessary to recite them. Difficulties have been experienced in the cost of maintenance of students and losing their services while away from the farm. Then, too, there has been too often distraction which has drawn the young men away from the farm into other pursuits. How these difficulties may be met and the colleges turned to the most direct practical account to agriculture can hardly be better told than is done by President Adams of Cornell University, in these words:

"It is worthy of note that the nature of these difficulties does not depend at all upon the quality of instruction given in the colleges. The fault, therefore, I think, cannot fairly be said to be with the colleges themselves. The same embarrassments have been felt elsewhere in the world, though probably to a more limited extent. In Germany, in France, indeed everywhere on the continent of Europe, scientific farming is a more absolute necessity than it is felt to be in this country; and, therefore, something like scientific training is regarded as quite indispensable. But even in those countries, until other means than those of instruction to students were devised for bringing the results of scientific instruction to the knowledge of farmers, the agricultural colleges failed to accomplish the good that has since been the result of their efforts. It was found that if the farmers, and the sons of farmers, could not spend time to go to the agricultural colleges, then the agricultural colleges must devise some means of going to the farmers. When they discovered that the mountain would not come to Mohammed, they contrived a means by which Mohammed could go to the mountain. This was the object of the experiment stations in Germany and other parts of Europe. It was known that at every efficient agricultural college experiments were carried on, a knowledge of which would be of vast benefit to the farming community, if the results of those experiments could be published and placed before the farmers at their own homes. In this way it was that, in Germany especially, and in a less measure in all the other countries of Europe, the difficulties we have experienced were met with and overcome. In providing, therefore, the means for establishing experiment stations and publishing the reports of experiments made, Congress will simply be doing what the experience of the world teaches to be an absolute necessity, if we would reap the full benefit to be received from our agricultural colleges."

Continuing his argument, President Adams shows how Cornell University is equipped with grounds and laboratories and libraries and trained scientific investigators, who are all ready to turn their attention vigorously to this work, if the General Government will provide the means, which are chiefly in the way of materials and assistants and facilities for publication. What is offered on the part of Cornell University is also at command in many of the Agricultural Colleges. California is well fitted to go ahead with the work vigorously and intelligently. Our readers know already how much Professor Hilgard is doing continually in his laboratories, and by the help of his trained assistants, in attacking problems which are of immediate and most practical importance to the agriculturists of this State. It may not be generally known how wide reaching this work is, and how far the College at Berkeley is enlisting the coöperation of practical men and women in all parts of the State in carrying forward its experimental work. There are upwards of four hundred persons who are now conducting experiments in the growth of plants and observation of pests and diseases, the value of different soils for special growths of grass and cereals and fruits of all kinds, and other valuable work, under the direct suggestion, and with the materials furnished them by the College of Agriculture at Berkeley. This work is now the joint work of the State and the General Government, as the Morrill grant furnished a good part of the outfit, and the State, by its appropriations, has supplemented this, and furnished means for carrying on the work. Professor Hilgard and those associated with him, look upon an increase of their facilities for work and the closer alliance with the Department of Agriculture at Washington, as the most valuable and opportune thing that could be done for the advancement of agricultural knowledge in this State. No one knows better than they the requests and needs of the people in this respect, and certainly the government has at its command services which are perfectly adapted to carrying forward its proposed work.

The importance of careful experimental work is nowhere more generally recognized than in California. Nowhere are conditions so new and so little understood. Nowhere are there obscure influences which need more to be brought to light, and in no way could the General Government do a more beneficent act for our agricultural practice, than by the provision for the establishment of stations in this State. The Department of Agriculture is doing very much for us now through its agents here who are gaining information statistical, horticultural, entomological, etc., for the general good. Now let all these efforts be unified; take the services of the trained investigators of the State institution, grant the request of our most representative agricultural bodies, and let the bill for the establishment of experiment stations quickly pass.

MUSEUMS OF THE UNIVERSITY.

As I understand it, the chief uses of museums are two. The first and more particular use of a museum is to furnish typical specimens for illustration and experiment to the special students in a given department. To subserve this use, a museum should be attached to each of certain departments—should be situated near to the lecture-rooms, and should be under the immediate control of the professor in charge of the department, and under the general direction of the Museum Committee of the Board of Regents. Such museums need not be extensive nor specially costly.

The second use of a museum is, I conceive, to furnish general instruction to a large class of people, such as the body of undergraduate students at Berkeley, who have no *special* knowledge, but who desire simply a general and somewhat popular view. A museum of this class should be very large—entirely adapted to the display of its specimens, and capable of great growth. I can conceive of no better model for such a museum than that furnished by the National Museum at Washington, under the charge of Professor Baird. The art of designing such structures has lately made great advances. Such general collections are of the greatest value to the students of the University, who by simply walking through them many times during their college course acquire correct general notions about a great many subjects not otherwise easily brought to their attention.

They are also extremely valuable as a means of education to the general public who visit the University, and serve as an admirable advertisement to the institution and greatly increase its general usefulness. If there are no practical obstacles in the way it would appear to be wise to keep in mind the possibility of establishing in San Francisco a building for the purposes of exhibiting all our general collections and museums, while special museums remain attached to the various departments at Berkeley. For every person who visits our general museums at Berkeley a hundred persons would visit such a general museum established in San Francisco. The record of visitors at the State Mining Bureau in San Francisco amply proves this assertion. I know of no way in which to popularize the University better than to establish such a general museum building in San Francisco, and I conceive that such a museum would serve a far higher use than to popularize the University, for it would make its collections immediately available to the whole population. The undergraduate students would use it as much in San Francisco as they now do in Berkeley. Such a museum should, in my opinion, be built on the general plan of the National Museum at Washington, which is a cheap substantial building of brick, iron, and glass, mainly of one story. The central portion of the building is devoted to the purposes of the collection. At the corners are two-story structures, which serve for offices for the curators, for laboratories, for preparing casts and photographs, etc. Attached to these laboratories are lecture rooms where popular and other lectures can be given to the students and to invited visitors.

I should very much like to see certain portions of the instruction to the Senior Classes now at Berkeley given in San Francisco in such lecture rooms. The seats necessary for the Senior Class should be reserved for them, and tickets for the remaining seats should be given to such persons as desire to attend. I feel sure that in San Francisco such lecture rooms would be always filled, and that this could be accomplished without the slightest detriment to the practical instruction of the Senior Class itself, and to the great benefit of such persons as would attend from the city. If this desirable end can be reached, the usefulness of the University to the community would be trebled, since our higher instruction would then be available to all the students in the professional colleges. It appears to me we might well look forward to the establishment of such a central building in San Francisco. Our collections at Berkeley now grow slowly through the personal solicitations of the Curator to his personal friends or acquaintances. The same collections in San Francisco would grow very rapidly, through the gifts of visitors and the donations of many interested persons.

Moreover, there is no way so practicable as this in which the collections now at Berkeley can be made immediately useful to the students of the professional colleges in San Francisco. More than half of the students of the University reside in San Francisco.

ENDOWMENT OF TWO LE CONTE PROFESSORSHIPS.

Officers of the University are frequently asked in what manner friends of the University could best show their interest in the work of education, in California. It appears that there are many persons who would be glad to do some useful thing for the University, provided a suitable object was presented to them. No more useful and graceful gift could be made than that of a sum of money to found two Professorships, one of physics, the other of comparative anatomy and physiology, thus endowing the chairs, which are now held by Professor John and Professor Joseph Le Conte, the Fathers of the University of California. The endowment of each chair should be $75,000.

CIRCULAR TO ALUMNI.

In March, 1886, I caused a circular to be prepared and sent to each graduate of the University, asking for his history since graduation. Very full answers have been received to this circular, and the materials for a tolerably complete history of the University are now in our hands.

CIRCULARS TO MEMBERS OF THE ACADEMIC SENATE.

Similar circulars have been sent to all members of the Academic Senate, and from the replies an adequate idea of the intellectual activity and product of the University, as a whole, can be formed. The answers to these are printed herewith as Appendix A.

CIRCULARS REGARDING TEACHERS.

At the suggestion of the Dean of the Colleges of Letters and of Science, and with the object of aiding Boards of Education and Principals of private academies to select our best graduates to fill vacant positions, I caused the following two circulars to be prepared and properly circulated. The results already attained show that the step was a wise one, and lead me to hope that it will prove of real benefit to the State:

CIRCULAR TO THOSE REQUIRING TEACHERS.

President's Office, University of California.

My Dear Sir: With a view to making the University more serviceable to the State, to assisting its graduates to honorable positions as teachers, and to placing the officers of instruction at the University in possession of the means of answering in a systematic and effective way, requests for information concerning competent persons eligible to such positions, I have caused to be deposited in the President's office a record of those graduates of the University who are, or desire to be, engaged in teaching. This record includes name and address, degrees received from institutions of learning, occupation, past and present, special qualifications, etc. In addition to information of this sort, personal estimates of the character and abilities of graduates who become applicants for positions as teachers, can, in most cases, be furnished by members of the Academic Staff of the University.

I therefore solicit such correspondence with you concerning these matters as you may consider advisable, and also such other correspondence concerning questions of general educational interest in the State as in your judgment would be mutually serviceable to us.

Very respectfully yours,

EDWARD S. HOLDEN,
President of the University of California.

CIRCULAR TO GRADUATES.

President's Office, University of California.

—— ——.

With a view to making the University more serviceable to the State, to assisting its graduates to honorable positions as teachers and to elevating the teacher's profession to a higher plane in the estimation of the public, the authorities desire to foster more cordial relations and a more effective coöperation between the University and the schools of the Pacific Coast—particularly the High Schools and Private Academies.

As an initiative step in this direction it is proposed to keep a list of those graduates of the University—with their addresses and occupations—who are either engaged in teaching, or seek positions as teachers. This list will be entirely private and confidential. Such a list will place the officers of instruction at the University in possession of the means for answering in a systematic and effective way requests for information concerning competent persons eligible to such positions.

As soon as replies to this circular are received in sufficient numbers to justify it, there will be sent to the various Boards of Education in the State and to the proprietors of private schools the announcement that we have the means of supplying them with information which will be of service to them in selecting teachers. By this means we hope to encourage the friendly attitude of Boards of Education towards our graduates.

You will, I am confident, agree with me, that it will be of important advantage both to the University and to its graduates to make this list as complete as possible and to keep it accurate. If the plan meets your approval, and you intend to follow the profession of teaching, will you kindly fill out and return the enclosed blank, and keep the President of the University informed in the future of any change in your address or in your plans and prospects? It is needless to say that all information on this list will be regarded as confidential, unless you authorize us to make it known.

Very faithfully yours,

EDWARD S. HOLDEN, President.

Name and address, —— ——. Date of graduation and title of degree, ——. Higher degrees and where taken, ——. Is it your intention to follow teaching as a profession? ——. School or college in which you are now employed, ——. Nature of the position held therein, ——. How long have you been engaged in teaching and where? ——. Other occupation, if not engaged in teaching, ——. What positions have you held in the past? ——. Present salary, ——. Other income which the position yields, ——. Subject adopted as your specialty, ——. Subjects already taught, ——. Additional subjects in which you are prepared to teach, ——. Religious preferences, ——. Do you desire that the University should give your name to School Boards and others inquiring for teachers? ——.

THE LICK OBSERVATORY.

By the courtesy of the Lick Trustees, I have spent a large part of the Summer of 1886 at Mount Hamilton, where I have been engaged in assisting the President of the Lick Trustees, Captain R. S. Floyd, in forwarding the work. I have the pleasure to say that every portion of the work at Mount Hamilton is in a very advanced state. All of the observatory is practically completed except the large dome. The brick work of this was finished August fifth. As the contractors for the iron and steel work were seriously delayed by strikes, the superstructure will not be completed until the Spring of 1887.

There is every reason to believe that the objective for the 36-inch telescope will be completed and delivered during 1886. The photographic lens will probably be delivered by June 1, 1887. The mounting for the large telescope will be erected at Mount Hamilton during June, 1887. By this time all the smaller instruments and apparatus should be finished and in place. It is probable that the Lick Trustees will be ready to turn the completed observatory over to the Regents of the University during the autumn of 1887. I add a brief memorandum of the present financial condition of the observatory, the data for which have been kindly furnished me by the Secretary of the Lick Trustees. It is intended only to give a general idea of the prospects of the observatory in the future. I also add a few words regarding the wants of the observatory:

Memorandum.

Mr. Lick's original gift to the Lick Observatory was $700,000. The deed of trust was so drawn that this $700,000 alone was available, and that all the expenses of building the observatory had to be paid out of this sum; none of the interest which this sum has earned during the eleven years that the trust has lived being available for the observatory, but going to the residuary legatees, who are the Society of Pioneers and the California Academy of Sciences. Under the present circumstances the observatory costs at least $500 per month to care for, and this $500 must be regularly paid from the capital. Up to May 16, 1886, $367,500 have been expended in leveling off the top of the mountain, constructing waterworks, building all the buildings except the great dome, providing a water supply, buying all the instruments, except the mounting of the large telescope, etc. There then remains of the fund unexpended $332,000. The dome will cost, complete in place, $56,800; the mounting for the large telescope will cost, complete, $40,000. It will require about $10,000 to build the brickwork of the dome on the mountain; miscellaneous expenses for one year will be about $6,000; spectroscopes, etc., will require an expense of about $2,000; a hydraulic floor will cost $16,500; unestimated minor expenses will be about $8,000. The sum of all these items is $506,800, leaving available for the support of the observatory $193,200. This latter sum, or so much as remains of the original fund, will be turned over to the Regents of the University of California, by the Lick Trustees, some time during 1887. The Regents of the University have then to invest this in such securities as they can find as a permanent endowment fund, out of which must be paid all the expenses of the observatory, for salaries, for maintenance, repairs, and additions. It will be scarcely prudent to compute that the income can be more than five per cent of this sum, that is less than $10,000. The State of California has agreed to print volume 1 of our publications, which is now in the press. It is perhaps hardly safe to assume that the State will be willing to continuously print such very technical work always, and it is of great importance that a publication fund should be established. The publication fund should not be less than $25,000, the interest on which ($1,250) will enable us to publish our work in a suitable manner. It must be remembered that under the most favorable circumstances the State can only pay for such publications as can be printed with ordinary types. One of the principal objects of the observatory will be to make a photographic map of the whole heavens, by means of the large telescope and its photographic objective. To express the results of this work it will be necessary to publish maps by photo-lithography or otherwise. These maps could, under no circumstances, be paid for by the State, unless by a special appropriation.

This photographic work is of immense importance, and the most brilliant results may be expected to follow from it if it is prosecuted intelligently and faithfully. To do this, the observatory should have a fund available for photographic and spectroscopic work only. The largest part of the interest of this fund should be expended in paying the salaries of two persons—one an astronomer, who attends to this spectroscopic work and overlooks the photographic operations, the other a professional photographer of the highest skill, who attends to the very delicate photographic manipulation. The salary of the astronomer should not be less than $3,000 per year. The salary of the photographer should not be less than $2,400 per year.

The best gift that could be made to the observatory would be one which should provide for the salaries of these two men by interest on a special fund. This fund should be called "The (name of the donor) Fund for Photographic and Spectroscopic Investigations."

In administering the expenses of the observatory, we have felt obliged to cut down the appropriation for a library to its very lowest limits. A proper astronomical library should contain some seventeen or eighteen thousand volumes, and should cost about $25,000. The Lick Trustees have purchased about one thousand volumes of these, making the selections of the ones that are absolutely essential for our work, and have trusted to the generosity of private citizens of California to provide a library for the Lick Observatory, which should bear the name of the donor, thus, "(name of the donor) Astronomical Library of the University of California."

A gift of $25,000 outright for the purchase of a large astronomical library, and the provision for an annual income of about $2,000 for subscription to astronomical and mathematical periodicals, and the purchase and binding of books, would be one of the most practical and valuable additions to our equipment.

The library has already received many valuable gifts from learned societies, from observatories, and from astronomers in Europe and in America. Professor Joseph Le Conte, of Berkeley, has kindly presented us with several valuable astronomical works from his private library, and John R. Jarboe, Esq., has generously given us a complete set of the Penny Cyclopædia, which is important on account of its mathematical articles.

The observatory has been built with a careful eye to its annual running expenses being kept small. It is very completely equipped as to its instruments, except as regards its library. Its chief need is, and will be, funds producing an annual income for the payment of astronomers to utilize its magnificent outfit.

DEGREES CONFERRED IN 1885.

The Degree of Doctor of Philosophy upon:

John Maxson Stillman	of Boston, Massachusetts.

The Degree of Master of Arts upon:

Brewton Allston Hayne	of Santa Barbara.

The Degree of Bachelor of Arts upon:

Joseph Edwin Barber	of North Temescal.
William Augustus Brewer	of San Mateo.
Francis Dunn	of San Francisco.
Henry Edward Clermont Feusier	of San Francisco.
Albert Karl Happersberger	of San Francisco.
Stephen Duncan Hayne	of Santa Barbara.
Joseph Arnold Heyman	of Sacramento.
Elliott Ward McAllister	of Benicia.
William Vincent Meeks	of Oakland.
Edward Williston Putnam	of San Francisco.
George Rothganger	of San Francisco.
Claude Buchanan Wakefield	of Garden Valley.

The Degree of Bachelor of Letters upon:

Paul Francis Brown	of San Benito.
Herman Bradford Bryant	of Oakland.
Mary Marston Campbell	of Oakland.
William Fitch Cheney	of Chico.
Mary Alice Crittenden	of San Francisco.
George Edwards	of Sacramento.
Alice Gibbons	of Alameda.
Fannie Williams McLean	of Los Angeles.
Helen Lawrence Shearer	of Oakland.
Andrew L. Stone	of San Leandro.
Sadie Bachelder Treat	of Berkeley.

The Degree of Bachelor of Philosophy upon:

Adelaide Margaret Fulton	of Berkeley.
George Edward Riley	of Grass Valley.

The Degree of Bachelor of Science upon:

Merton Joseph Congdon	of Berkeley.
Nona Laura Dibble	of Berkeley.
Henry Edward Dikeman	of Rough and Ready.
Emanuel Siegfried Heller	of San Francisco.
Harry East Miller	of Oakland.
Charles Marsden Myrick	of San Francisco.
Thomas Bartlett Russell	of Haywards.

Hattie Levantia Shaw .... of Berkeley.
John Grant Sutton .... of Portland, Oregon.
Edwin Stafford Warren .... of Haywards.

HONORS AND PRIZES.

Commencement Appointments, May 27, 1885.

William Augustus Brewer .... of San Mateo.
Oration: The Modern Revival of Old English.

Alice Gibbons .... of Alameda.
Essay: The Epics of Dante and Milton.

John Grant Sutton .... of Portland, Oregon.
Oration: War as a Civilizing Agent.

The University Medal.

[For general excellence in scholarship.]

Claude Buchanan Wakefield .... Class of 1885.

DEGREES CONFERRED IN 1886.

The Honorary Degree of Doctor of Laws upon:

Edward Charles Pickering, A.M., Phillips Professor of Astronomy and Professor of Geodesy in Harvard University, and Director of the Harvard College Observatory.

The Degree of Master of Arts (on examination) upon:

Frederick Hiram Clark, A.B. .... of Los Angeles.
(University of California, 1882.)

The Degree of Bachelor of Arts upon:

Thomas Abraham Barnett .... of San Francisco.
Gulielma Ruth Crocker .... of Centerville.
Charles Louis Biedenbach .... of San Francisco.
Kimball Gushee Easton .... of Berkeley.
Frank Fischer .... of San Francisco.

The Degree of Bachelor of Science upon:

Alfred Braverman .... of San Francisco.
George Thomas Clark .... of Berkeley.
James Kennedy Moffitt .... of Oakland.
Robert Chester Turner .... of Oakland.
Waldo Sprague Waterman .... of San Bernardino.

The Degree of Bachelor of Letters upon:

Leslie Alexander Jordan .... of Healdsburg.
Frances Royal Sprague .... of Haywards.
Alice Chapman .... of Nevada City.

The Degree of Bachelor of Philosophy upon:

Alexander Grimes Eells .... of Santa Barbara.
Edward Averett Howard .... of Oakland.
Harriet Lane Levy .... of San Francisco.
Ida Chadeayne Miller .... of San Francisco.

HONORS AND PRIZES.

Commencement Appointments, June 30, 1886.

Alexander Grimes Eells .... of Santa Barbara.
Oration: The Modern Form of Fatalism.

Harriet Lane Levy .... of San Francisco.
Essay: Wanted, A Comedy.

Frank Fischer .... of San Francisco.
Oration: The Chevalier Bayard: A Type of Nobility.

James Kennedy Moffitt .... of Oakland.
Thesis: Experiments on the Treatment of California Gold Ore.

[Excused from speaking.]

The University Medal.

[For general excellence in scholarship.]

FRANK FISCHER ....Class of 1886.

COLLEGE OF LETTERS.

FACULTY AND INSTRUCTORS.

EDWARD S. HOLDEN, LL.D., President of the University.
GEORGE WOODBURY BUNNELL, A.M., Professor of the Greek Language and Literature.
ALBERT S. COOK, Ph.D., Professor of the English Language and Literature.
STEPHEN J. FIELD, LL.D., Honorary Professor of Law.
EUGENE W. HILGARD, Ph.D., Professor of Agriculture, Agricultural Chemistry, General and Economic Botany.
GEORGE H. HOWISON, A.M., LL.D., Mills Professor of Intellectual and Moral Philosophy and Civil Polity.
JAS. A. HUTTON (1st Lieut. Eighth Infantry, U. S. A.), Professor of Military Science and Tactics.
A. WENDELL JACKSON, JR., Ph.B., Professor of Mineralogy, Petrography, and Economic Geology.
MARTIN KELLOGG, A.M., Professor of the Latin Language and Literature.
JOHN LE CONTE, M.D., LL.D., Professor of Physics.
JOSEPH LE CONTE, M.D., LL.D., Professor of Geology and Natural History.
BERNARD MOSES, Ph.D., Professor of History and Political Economy.
ALBIN PUTZKER, Professor of the German Language and Literature.
WILLARD B. RISING, Ph.D., Professor of Chemistry.
FRANK SOULÉ, JR. (U. S. Military Academy), Professor of Civil Engineering and Astronomy.
IRVING STRINGHAM, Ph.D., Professor of Mathematics.
——— ———, Agassiz Professor of Oriental Languages and Literature.

C. B. BRADLEY, A.B., Assistant Professor of the English Language and Literature.
JOHN B. CLARKE, Ph.B., Assistant Professor of Mathematics.
GEORGE C. EDWARDS, Ph.B., Assistant Professor of Mathematics.

WILLIAM W. DEAMER, A.B., Instructor in Latin and Greek.
EDWARD LEE GREENE, Instructor in Botany.
HENRY B. JONES, Instructor in French.
WM. CAREY JONES, A.M., Instructor in United States History and Constitutional Law.
EDMOND C. O'NEILL, Ph.B., Instructor in Chemistry.

WILLIAM D. ARMES, Ph.B., Assistant in English.

COLLEGE OF LETTERS.

CLASSICAL COURSE.

The Classical Course corresponds to the usual academic course of the leading American colleges. It is designed to afford preparation for professional study, and to furnish a liberal education. Prominence is given to the study of both Latin and Greek.

All the instruction in Latin and Greek aims to bring out the relation of those languages to our own. Prominence is given to such works, preceptive or illustrative, as bear on the art of public speaking.

LITERARY COURSE.

The Literary Course has the same general purpose as the Classical Course. The principal difference in the curriculum is that students in the Literary Course do not take Greek, and as an offset pursue a fuller course in English, in History, and in French, and German.

A broad foundation of literary, historical, and scientific culture is laid in the Literary as well as in the Classical Course.

COURSE IN LETTERS AND POLITICAL SCIENCE.

Terms of Admission.—Students may enter upon this course by complying with the requirements for admission to the Classical Course, or with those of the Literary Course, or with those of any one of the courses in Science; or they may enter the Junior Class of this course after completing the first two years of either the Classical or the Literary Course.

Course of Instruction.—The characteristic feature of the course is, that it gives prominence to historical, political, and economic topics. These constitute a basis of required studies extending throughout four years, and are supplemented by required Mathematics and Physics, and by a list of elective studies, embracing, in the Freshman and Sophomore years, Latin, Greek, English, German, and Philosophy; in the Junior year, English, French, German, Roman Law, Jurisprudence, Philosophy, Zoölogy, and advanced Physics; in the Senior year, English, French, German, Philosophy, Geology, and advanced work on the judicial interpretation of the Constitution of the United States.

COLLEGE OF AGRICULTURE.

Faculty and Instructors.

Edward S. Holden, LL.D., President of the University.
Albert S. Cook, Ph.D., Professor of the English Language and Literature.
Eugene W. Hilgard, Ph.D., Professor of Agriculture, Agricultural Chemistry, General and Economic Botany.
James A. Hutton (1st Lieut., Eighth Infantry, U. S. A.), Professor of Military Science and Tactics.
A. Wendell Jackson, Jr., Ph.B., Professor of Mineralogy, Petrography, and Economic Geology.
John LeConte, M.D., LL.D., Professor of Physics.
Joseph LeConte, M.D., LL.D., Professor of Geology and Natural History.
Bernard Moses, Ph.D., Professor of History and Political Economy.
Albin Putzker, Professor of the German Language and Literature.
Willard B. Rising, Ph.D., Professor of Chemistry.
Frank Soulé, Jr. (United States Military Academy), Professor of Civil Engineering and Astronomy.
Irving Stringham, Ph.D., Professor of Mathematics.

C. B. Bradley, A.B., Assistant Professor of the English Language and Literature.
John B. Clarke, Ph.B., Assistant Professor of Mathematics.
George C. Edwards, Ph.B., Assistant Professor of Mathematics.
F. Slate, Jr., Assistant Professor of Physics and Mechanics.
E. J. Wickson, A.M., Lecturer on Practical Agriculture.

Edward Lee Greene, Instructor in Botany.
Henry B. Jones, Instructor in French.
Hermann Kower, C.E., Instructor in Instrumental Drawing.
Edmond C. O'Neill, Ph.B., Instructor in Chemistry.
William G. Raymond, C.E., Instructor in Civil Engineering.

Assistants.

William D. Armes, Ph.B., Assistant in English.
James P. H. Dunn, B.S., Assistant in Chemistry.
Myer E. Jaffa, Ph.B., Assistant in the Viticultural Laboratory.
Frederick W. Morse Ph.B., Assistant in the Agricultural Laboratory.
George Elden Colby, Ph.B., Second Assistant in the Viticultural Laboratory.

COLLEGE OF MECHANICS.

Faculty and Instructors.

Edward S. Holden, LL.D., President of the University.
Albert S. Cook, Ph.D., Professor of the English Language and Literature.

Frederick G. Hesse, Professor of Mechanical Engineering.
Jas. A. Hutton (1st Lieut., Eighth Infantry, U. S. A.), Professor of Military Science and Tactics.
John Le Conte, M.D., LL.D., Professor of Physics.
Joseph Le Conte, M.D., LL.D., Professor of Geology and Natural History.
Albin Putzker, Professor of the German Language and Literature.
Willard B. Rising, Ph.D., Professor of Chemistry.
Frank Soulé, Jr. (U.S. Military Academy), Professor of Civil Engineering and Astronomy.
Irving Stringham, Ph.D., Professor of Mathematics.

C. P. Bradley, A.B., Assistant Professor of the English Language and Literature.
John B. Clarke, Ph.B., Assistant Professor of Mathematics.
George C. Edwards, Ph.B., Assistant Professor of Mathematics.
F. Slate, Jr., Assistant Professor of Physics and Mechanics.

Henry B. Jones, Instructor in French.
Hermann Kower, C.E., Instructor in Instrumental Drawing.
Edmond C. O'Neill, Ph.B., Instructor in Chemistry.
William G. Raymond, C.E., Instructor in Civil Engineering.

Assistants.

William D. Armes, Ph.B., Assistant in English.
James P. H. Dunn, B.S., Assistant in Chemistry.
Joseph A. Sladke, Superintendent of the Machine Shop.

COLLEGE OF MINING.

Faculty and Instructors.

Edward S. Holden, LL.D., President of the University.
William Ashburner, Honorary Professor of Mining.
Samuel B. Christy, Ph.B., Professor of Mining and Metallurgy.
Albert S. Cook, Ph.D., Professor of the English Language and Literature.
Frederick G. Hesse, Professor of Mechanical Engineering.
James A. Hutton (1st Lieut. Eighth Infantry, U. S. A.), Professor of Military Science and Tactics.
A. Wendell Jackson, Jr., Ph.B., Professor of Mineralogy, Petrography, and Economic Geology.
John LeConte, M.D., LL.D., Professor of Physics.
Joseph LeConte, M.D., LL.D., Professor of Geology and Natural History.
Albin Putzker, Professor of the German Language and Literature.
Willard B. Rising, Ph.D., Professor of Chemistry.
Frank Soulé, Jr. (U. S. Military Academy), Professor of Civil Engineering and Astronomy.
Irving Stringham, Ph.D., Professor of Mathematics.

C. B. Bradley, A.B., Assistant Professor of the English Language and Literature.
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George C. Edwards, Ph.B., Assistant Professor of Mathematics.
F. Slate, Jr., Assistant Professor of Physics and Mechanics.

Henry B. Jones, Instructor in French.
Hermann Kower, C.E., Instructor in Instrumental Drawing.
Edmond C. O'Neill, Ph.B., Instructor in Chemistry.
William G. Raymond, C.E., Instructor in Civil Engineering.

Assistants.

William D. Armes, Ph.B., Assistant in English.
James P. H. Dunn, B.S., Assistant in Chemistry.

COLLEGE OF CIVIL ENGINEERING.

Faculty and Instructors.

Edward S. Holden, LL.D., President of the University.
Albert S. Cook, Ph.D., Professor of the English Language and Literature.
George Davidson, A.M., Honorary Professor of Geodesy and Astronomy.

Frederick G. Hesse, Professor of Mechanical Engineering.
James A. Hutton (First Lieutenant Eighth Infantry, U. S. A.), Professor of Military Science and Tactics.
John Le Conte, M.D., LL.D., Professor of Physics.
Joseph Le Conte, M.D., LL.D., Professor of Geology and Natural History.
Albin Putzker, Professor of the German Language and Literature.
Willard B. Rising, Ph.D., Professor of Chemistry.
Frank Soulé, Jr. (U. S. Military Academy), Professor of Civil Engineering and Astronomy.
Irving Stringham, Ph.D., Professor of Mathematics.

C. B. Bradley, A.B., Assistant Professor of the English Language and Literature.
John B. Clarke, Ph.B., Assistant Professor of Mathematics.
George C. Edwards, Ph.B., Assistant Professor of Mathematics.
F. Slate, Jr., Assistant Professor of Physics and Mechanics.

Henry B. Jones, Instructor in French.
Hermann Kower, C.E., Instructor in Instrumental Drawing.
Edmond C. O'Neill, Ph.B., Instructor in Chemistry.
William C. Raymond, C.E., Instructor in Civil Engineering.

Assistants.

William D. Armes, Ph.B., Assistant in English.
James P. H. Dunn, B.S., Assistant in Chemistry.

COLLEGE OF CHEMISTRY.

Faculty and Instructors.

Edward S. Holden, LL.D., President of the University.
Samuel B. Christy, Ph.B., Professor of Mining and Metallurgy.
Albert S. Cook, Ph.D., Professor of the English Language and Literature.
Eugene W. Hilgard, Ph.D., Professor of Agriculture, Agricultural Chemistry, General and Economic Botany.
James A. Hutton (First Lieutenant, Eighth Infantry, U. S. A.), Professor of Military Science and Tactics.
A. Wendell Jackson, Jr., Ph.B., Professor of Mineralogy, Petrography, and Economic Geology.
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Joseph Le Conte, M.D., LL.D., Professor of Geology and Natural History.
Bernard Moses, Ph.D., Professor of History and Political Economy.
Albin Putzker, Professor of the German Language and Literature.
Willard B. Rising, Ph.D., Professor of Chemistry.
Frank Soulé, Jr. (United States Military Academy), Professor of Civil Engineering and Astronomy.
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John B. Clarke, Ph.B., Assistant Professor of Mathematics.
George C. Edwards, Ph.B., Assistant Professor of Mathematics.
F. Slate, Jr., Assistant Professor of Physics and Mechanics.

Edward Lee Greene, Instructor in Botany.
Henry B. Jones, Instructor in French.
William Carey Jones, A.M., Instructor in United States History and Constitutional Law.
Hermann Kower, C.E., Instructor in Instrumental Drawing.
Edmond C. O'Neill, Ph.B., Instructor in Chemistry.
William G. Raymond, C.E., Instructor in Civil Engineering.

Assistants.

William D. Armes, Ph.B., Assistant in English.
James P. H. Dunn, B.S., Assistant in Chemistry.
Adolph Sommer, Ph.G., Assistant in Chemistry.

HASTINGS COLLEGE OF THE LAW.

Directors.

Hon. R. F. Morrison, San Francisco,
Chief Justice of the Supreme Court, ex officio President of the Board.

Col. J. P. Hoge	San Francisco.
Hon. J. R. Sharpstein	San Francisco.
Hon. Oliver P. Evans	San Francisco.
Ralph C. Harrison, Esq.	San Francisco.
S. M. Wilson, Esq.	San Francisco.
Thomas B. Bishop, Esq.	San Francisco.
Thomas I. Bergin, Esq.	San Francisco.

Faculty.

Edward S. Holden, LL.D., President.
Charles W. Slack, LL.B., Acting Professor of Municipal Law.
S. Clinton Hastings, LL.D., Professor of Comparative Jurisprudence.
J. H. C. Bonté, A.M., D.D., Professor of Legal Ethics.
Joseph W. Winans, A.M., Dean.
Perrie Kewen, Registrar.

COLLEGE OF DENTISTRY.

Faculty.

Edward S. Holden, LL.D., President of the University.
Joseph Le Conte, M.D., LL.D., Honorary Professor of Biology.
S. W. Dennis, M.D., D.D.S., Professor of Operative Dentistry and Dental Histology.
C. L. Goddard, A.M., D.D.S., Professor of Mechanical Dentistry, and Dean of the Faculty.
M. W. Fish, M.D., Professor of Physiology.
W. E. Taylor, M.D., Professor of the Principles and Practice of Surgery.
A. L. Lengfeld, M.D., Professor of Chemistry and Materia Medica.
Wm. B. Lewitt, M.D., Professor of Anatomy.
Maurice J. Sullivan, D.D.S., Clinical Professor of Operative Dentistry.
——— ———, Professor of Pathology and Therapeutics.

Demonstrators and Assistants.

J. Schneider, D.D.S., Demonstrator of Operative Dentistry.
Charles Boxton, D.D.S., Demonstrator of Mechanical Dentistry.
M. F. Gabbs, D.D.S., Demonstrator of Mechanical Dentistry.
John G. Day, M.D., Demonstrator of Anatomy.
Arnold D'Ancona, A.B., M.D., Assistant to the Chair of Physiology.
Winslow Anderson, M.D., Assistant to the Chair of Materia Medica and Medical Chemistry.

Clinical Instructors.

J. L. Asay, M.D.
C. F. W. Boedecker, M.D., D.D.S.
H. C. Davis, L.D.S.
L. L. Dunbar, D.D.S.
B. W. Haines, M.D., D.D.S.
J. H. Hatch, D.D.S.
W. B. Kingsbury.
A. F. McLain, M.D., D.D.S.
Thomas Morffew, D.D.S.
W. E. Price, D.D.S.
John Rabe, D.D.S.
Max Sichel.
J. L. Williams, D.D.S.

CALIFORNIA COLLEGE OF PHARMACY.

Faculty.

Edward S. Holden, LL.D., President of the University.
William T. Wenzell, M.D., Ph.G., Professor of Chemistry.
Hermann H. Behr, M.D., Professor of Botany.
Edward W. Runyon, Ph.G., Professor of the Theory and Practice of Pharmacy, and Dean of the Faculty.
Frederick Grazer, Ph.G., Professor of Materia Medica.

Charles S. Greene, Instructor in Latin.

Quiz Masters.

——— ———, in Chemistry.
——— ———, in Pharmacy.
J. J. B. Argenti, Ph.G., in Materia Medica and Botany.

TOLAND COLLEGE OF MEDICINE.

Faculty.

Edward S. Holden, LL.D., President of the University.

R. Beverly Cole, A.M., M.D., M.R.C.S., Eng., Professor of Obstetrics and Gynecology.

M. W. Fish, M.D., Professor of Physiology and Microscopy.

G. A. Shurtleff, M.D., Emeritus Professor of Mental Diseases and Medical Jurisprudence.

W. F. McNutt, M.D., M.R.C.P., Edin., etc., Professor of Principles and Practice of Medicine.

Robert A. McLean, M.D., Professor of Clinical and Operative Surgery, and Dean of the Faculty.

W. E. Taylor, M.D., Professor of Principles and Practice of Surgery.

George H. Powers, M.D., Professor of Ophthalmology and Otology.

F. B. Kane, M.D., F.R.C.S.I., Professor of Clinical Medicine and Pathology.

A. L. Lengfeld, M.D., Professor of Materia Medica and Medical Chemistry.

William B. Lewitt. M.D., Professor of Anatomy.

F. H. Terrill, A.M., M.D., Professor of Therapeutics.

Benjamin R. Swan, M.D., Professor of Diseases of Children.

Washington Ayer, M.D., Professor of Hygiene.

William H. Mays, M.D., Professor of Mental Diseases and Medical Jurisprudence.

College Dispensary Staff.

C. G. Kenyon, M.D., and W. B. Lewitt, M.D., Surgery.

Jules Simon, M.D., Nervous Diseases.

Luke Robinson, M.D., M.R.C.P., Eng., and H. W. Dodge, M.D., Medicine.

Demonstrators and Assistants.

John G. Day, M.D., Demonstrator of Anatomy.

Arnold A. D'Ancona, A.B., M.D., Assistant to the Chair of Physiology.

Winslow Anderson, M.D., Assistant to the Chair of Materia Medica and Medical Chemistry.

Henry W. Dodge, M.D., Assistant to the Chair of Clinical Medicine and Pathology.

J. V. R. Hoff, M.D., U.S.A., Assistant to the Chair of Ophthalmology and Otology.

Jules Simon, M.D., Assistant to the Chair of Mental Diseases and Medical Jurisprudence.

L. A. Sabey, M.D., Curator.

EXAMINATIONS.

GENERAL LIST OF PREPARATORY SUBJECTS.

Applicants for admission to undergraduate courses at Berkeley must be at least sixteen years of age, must deposit with the Recorder a certificate of good moral character, and must pass a satisfactory examination in such of the following subjects as are designated below, for the Course and Status sought:

1. English. A short composition, correct in spelling, punctuation, paragraphing, and grammar, upon a subject announced at the time of the examination, and taken, in 1886 and until further notice, from the following works: Tom Brown's School days at Rugby; Scott's Lady of the Lake; Irving's Alhambra; Thackeray's Newcomes; Shakespeare's Merchant of Venice and Julius Cæsar (Rolfe's or the Clarendon Press edition).

Applicants will also be required to analyze sentences from these works, and to pass an examination on the first seventy-one lessons in Kellogg's Text-book or Rhetoric.

2. Arithmetic. Including the metric system. The technical parts of Commercial Arithmetic, viz.: banking, profit and loss, commission, taxes, duties, stocks, insurance, exchange, and average of payments, are not insisted on.

3. Algebra. (*a*) To Quadratic Equations, including the various methods of factoring, the theory of exponents, integral and fractional, positive and negative, and the calculus of radicals.

(*b*) Quadratic Equations, both single and simultaneous, their solution and their theory, including all the recognized methods of solution and all equations reducible to the quadratic form; formation of equations from given roots.

4. PLANE GEOMETRY. (*a*) All of Plane Geometry, except the metrical properties of regular polygons and the measurement of the circle.

(*b*) The general properties of regular polygons, their construction, perimeters, and areas; and the measurement of the circle, including the different methods for the determination of the ratio of the circumference to the diameter.

5. HISTORY AND GEOGRAPHY. History of the United States, and the general facts of Physical and Political Geography. Barnes's Brief History of the United States, and the Geographies used in the first grade Grammar Schools, will serve to indicate the amount of knowledge expected.

6. LATIN. Cæsar, Gallic War, Books I.–IV. (or Civil War, Books I.–II.); Cicero, the Four Catilinarian Orations; with questions, in both cases, on the implied grammar, and on the subject-matter and the corresponding archaeology; translation into Latin of simple English sentences.

7. LATIN. Cicero, the Orations *Pro Archia Poeta* and *Pro Lege Manilia*; Vergil, Aeneid, Books I.–VI.; with questions, in both cases, on the implied grammar, on the subject-matter and the corresponding archaeology, and, in the case of Vergil, on the prosody; sight translation of easy Latin prose; translation into Latin of brief connected narratives.

8. GREEK. Xenophon, Anabasis, Book I., with questions on the subject-matter, archaeology, and grammar (with especial reference to etymology); White's First Lessons in Greek, lessons I.–LX.; translation into Greek of simple English sentences.

9. GREEK. Xenophon, Anabasis, Books II.–IV., or Goodwin's Greek Reader, pp. 37–111; Homer, Iliad, Books, I.–II., omitting the catalogue of ships; with questions on the grammar (with especial reference to etymology), subject-matter, archaeology, and prosody; Jones's Greek Prose Composition, or its equivalent; sight translation of easy Greek prose.

10. ANCIENT HISTORY AND GEOGRAPHY. (*a*) Greek History to the death of Alexander, with the connected Geography.

(*b*) Roman History to the death of Commodus, with the connected Geography.

Smith's Smaller History of Greece, and Smith's Smaller (or Leighton's) History of Rome will serve to indicate the amount required.

11. PHYSICS. The elements of the subject, taught experimentally, as shown in some such work as Gage's Elements of Physics; Peck's Ganot (or a real equivalent) will cover the ground. Until 1887 any one of the topics included under Subject 12 following will be accepted as an equivalent for the Physics.

12. Any one of the following:

(*a*) CHEMISTRY. The elements of Chemistry (Eliot and Storer's Chemistry, Avery's Elementary Chemistry, or a thorough acquaintance with Mead's Chemical Primer). An examination in the more advanced chemistry will be offered to any who wish it. A successful completion of this examination will give the student admission to the chemical laboratory. Applicants who pass with honors will be put in an advanced division.

(*b*) BOTANY. The elements of Botany. An accurate knowledge of Part I of Gray's How Plants Grow, together with an acquaintance with the more prominent native or cultivated plants, their structure and botanical affinities.

(*c*) Physiology. The elements of Physiology (Hutchison's, or an equivalent).

(*d*) Mineralogy. The elements of Mineralogy. A good knowledge of the physical properties of minerals in general. Ability to determine, by their physical properties alone, twenty-five of the commonest minerals, and to give reasons for determination. First seventy-two pages of Nicol's Manual of Mineralogy, or first seventy-five pages of Dana's third edition.

(*e*) Plane Trigonometry. The development of the general formulæ of plane trigonometry, solution of plane triangles, and practice in the use of logarithmic tables. Four-place logarithmic tables are furnished for use in the examination.

(*f*) Free-hand Drawing. Line drawing from models, copying of patterns, etc. Particular attention is given to correctness of form and smoothness of outline. The applicant will be tested in that free-hand use of the pencil which will be of most immediate value to him in pursuing the subject of mechanical drawing and mapping.

13. History. History of England. Gardiner's History for Schools will indicate the amount. General history will be accepted instead, in unusual cases.

14. English. The examination in this subject will presuppose thorough study of the selections named below. The candidate should be prepared to elucidate in full the meaning of any passage in the works assigned; to paraphrase such passage; to point out the rhetorical figures in it; to answer questions concerning the lives of the authors and the subject-matter and structure of the works studied. The history of words should also receive attention, Skeat's Etymological Dictionary being taken as the authority. For the present, the examination in word-derivation will be limited to Spenser's Prothalamion.

Until further notice, the examination will be upon the following works: Scott's Lay of the Last Minstrel; Whittier's Snow-Bound; Longfellow's Evangeline; Lowell's Sir Launfal; Sir Roger de Coverley; Burke's Works, edited by Payne, Vol. I; and Hales' Longer English Poems, omitting Wordsworth's Laodamia and Shelley's Adonais.

Specimen Papers. Specimen examination papers in the foregoing subjects are contained in the Admission Circular [Bulletin No. 6], which will be sent to any address on application to the Recorder, Berkeley, California.

GROUPS OF SUBJECTS FOR THE SEVERAL COURSES.

Of the foregoing Subjects, one of the following Four Groups, or parts of them, must be taken, according to the Course and Status applied for:

I. For the Classical Course, Subjects 1, 2, 3*a*, 4*a*, 5, 6, 7, 8, 9, and 10.

II. For the Literary Course.—In 1886, Subjects 1, 2, 3*a*, 4*a*, 5, 6, 7, 10, and any two of the Subjects in 11 and 12.

In 1887 and afterwards, Subjects 1, 2, 3*a*, 4*a*, 5, 6, 7, 10, 13, and 14.

III. For the Course in Letters and Political Science.—In 1886, Subjects 1, 2, 3*a*, 4*a*, 5, 6, 7, 8, 9, 10; or 1, 2, 3*a*, 4*a*, 5, 6, 7, 10, and any two of the Subjects in 11 and 12; or 1, 2, 3 (*a* and *b*), 4, (*a* and *b*), 5, 13, 14, and any two Subjects in 11 and 12.

In 1887 and afterwards, Subjects 1, 2, 3*a*, 4*a*, 5; and either 6, 7, 8, 9, and 10; or 6, 7, 10, 13, and 14; or 3*b*, 4*b*, 11, 12, and either 6 or 14.

A signal failure in Subject 14 will exclude the applicant from this Course.

IV. For any of the five Courses in Science.—In 1886, Subjects 1, 2, 3 (*a* and *b*), 4 (*a* and *b*), 5, 13, 14, and any two of the Subjects in 11 and 12.

In 1887 and afterwards, Subjects 1, 2, 3 (*a* and *b*), 4 (*a* and *b*), 5, 11, 12, and either 6 or 14.

Applicants, if they so desire, may offer the requirements of 1887 in 1886.

For a Course at Large, either of the Four Groups required for admission to a Regular Course, as the applicant may elect. And in case the applicant proposes, if admitted, to take any study out of the prescribed order, all of the examinations required for its pursuit by a Regular Student must be passed before admission.

For a Special Course, such of the General List of Subjects as, in the judgment of the professors or instructors in charge of the special line of studies intended, are requisite for its proper pursuit. The list thus approved must be deposited with the Recorder before the examination. No applicant who has failed in the entrance examination for a Regular Course or a Course at Large will be allowed to take a Special Course.

For a Limited Course, Subjects 1, 2, 3*a*, 4*a*, and 5; and, in addition, any in the General List that are requisite to the studies sought by the applicant; if advanced studies are sought, the applicant must pass all the examinations conditional to them that are required of Regular Students. The exact list of requisite subjects must be ascertained through the Recorder, and deposited with him before the examination.

Applicants who pass their entire entrance examination without conditions will be credited with honors in the subjects in which they pass with especial excellence.

Any applicant for admission to a Regular Course or to a Course at Large may, at option, pass the entire entrance examination at one time or divide it between two years, passing part of it as a preliminary examination in one year, and completing the remainder the next year. But neither the preliminary examination nor the remainder in completion may be divided between the June and September examinations of the same year.

Applicants will not be admitted to the preliminary examination without certificates from their teachers that they are prepared in the subjects they offer. These certificates must be addressed to the Recorder of the Faculties, Berkeley, and must be in his hands previous to the examination.

Certificates of partial admission will only be issued for subjects passed without conditions, nor will any certificate be issued to an applicant who does not pass in at least five of the subjects offered. These subjects must be confined to Subjects 1, 2, 3*a*, 4*a*, 5, 6, 8, 10 (*a* or *b*), and 11 of the General List which must be grouped for the several Courses as follows:

I. For the Classical Course, Subjects 1, 2, 3*a*, 4*a*, 5, 6, 8, and 10 (*a* or *b*).

II. For the Literary Course, Subjects 1, 2, 3*a*, 4*a*, 5, 6, 10 (*a* or *b*), and 11.*

III. For the Course in Letters and Political Science, Subjects 1, 2, 3*a*, 4*a*, 5; and either 6, 8, and 10 (*a* or *b*); or 6, 10 (*a* or *b*), and 11;* or 11 and 6.

IV. For any of the five Courses in Science, Subjects 1, 2, 3*a*, 4*a*, 5, 11, and 6.

For a Course at Large, either of the preceding groups. But for no course will an examination be granted on part of a Subject.

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*In 1887, and afterwards, 13 will be substituted for 11 in this group.

ADMISSION FROM APPROVED PUBLIC SCHOOLS.

The following Regulation was adopted by the Board of Regents, March 4, 1884:

> Upon the request of the Principal of any public school in California whose course of study embraces, in kind and extent, the subjects required for admission to any College of the University, a committee of the Academic Senate will visit such school, and report upon the quality of the instruction there given. If the report of such committee be favorable, a graduate of the school, upon the personal recommendation of the Principal, accompanied by his certificate that the graduate has satisfactorily completed the studies of the course preparatory to the College he wishes to enter, may, at the discretion of the Faculty, be admitted without examination.

This system has not been in operation long enough to enable us to make a full report upon it. It is evidently a very important subject, and in order to give a proper judgment upon its working, several more years of experience will be required. It appears to be proper that the University authorities, in making their report on the examination of any school which asks to be placed on the "accredited list," should state fully in what ways the instruction in the school can be improved, if in any. If this duty is carried out in good feeling, and with a due sense of responsibility, as it will be, the result will be to weld the whole public school system into one organic whole. We are not yet prepared to admit private schools, however excellent, to our "accredited list."

STATEMENT OF RECEIPTS AND DISBURSEMENTS DURING THE FISCAL YEARS OF 1884-5 AND 1885-6.

Receipts.		
From endowments, trust funds, and State appropriations for 1884-5	$120,417 97	
From endowments, trust funds, and State appropriations for 1885-6	174,610 69	$295,028 66
From income available for payment of current expenses for 1884-5	$103,279 54	
From income available for payment of current expenses for 1885-6	115,364 19	218,643 73
Total receipts		$513,672 39
Disbursements.		
From endowments, trust funds, and State appropriations for 1884-5	$42,121 79	
From endowments, trust funds, and State appropriations for 1885-6	247,562 54	$289,684 33
From income available for payment of current expenses for 1884-5	$91,557 15	
From income available for payment of current expenses for 1885-6	90,498 72	182,055 87
Total disbursements		$471,740 20

The details of receipt and expenditure are given in the Secretary's reports for the fiscal years in question.

WANTS OF THE VARIOUS DEPARTMENTS OF THE COLLEGES OF LETTERS AND SCIENCE AT BERKELEY.

During the past year, I have diligently studied the wants of each of the departments at Berkeley, and I recapitulate them in what follows, as required by law:

PRESIDENT'S OFFICE.

The administration of a University, whose departments are situated both in San Francisco and in Berkeley, and one of whose departments is to be situated at the top of Mount Hamilton, will require an increase in the clerical force now available.

At present the salary of the President is $6,000 per year. He is assisted by a Recorder, whose salary is $900 per year.

It is necessary that the services of a clerk, at $1,200 a year, should be made available to the President and Secretary jointly. Total annual cost of administrative office as proposed, $8,100; *increase*, $1,200.

DEPARTMENT OF THE GREEK LANGUAGE AND LITERATURE.

At present the expenses of this department are as follows:

Salary of the Professor	$3,000 00
Half the salary of the Instructor—one half of $1,500	750 00
Total	$3,750 00

This department could be placed on a proper basis by giving the time of one instructor entirely to it, so that its total expenses would be $4,500 per year—increase, $750 yearly. I append to this a letter from the Professor in charge, showing the reasons why specific appropriations of $65 for Greek type, and $116 72 for Greek texts, are required—total, $181 72.

Berkeley, June 22, 1886.

President Holden:

Dear Sir: In accordance with your request, I would report as follows in regard to the needs of the Department of Greek:

1. In order that the questions for the entrance examinations may be printed in the University Printing Office, a font of Greek type is necessary. I learn that fifty pounds of type, at a cost of $1 30 per pound, will be sufficient. Total cost, $65.

2. It is very essential that Greek texts, for use in the entrance examinations and for sight reading in the various classes, should be furnished. By the use of these texts in the entrance examinations, the Greek necessary to be printed will be reduced to such Greek words as occur in the questions. A material reduction of the expense of printing the papers for the entrance examinations will thus be effected. The following list contains the tests necessary for the entrance examinations. They are published by Teubner in Leipzig, and are the cheapest to be had:

	Marks.
30 copies of Xen. Hist. Graec. @ M. — .90	27.
30 copies of Plato, Abteil. I @ M. — .60	18.
30 copies of Hom. Il., Pars I @ M. — .75	22.50
30 copies of Xen. Anab. @ M. — .75	22.50

The following list contains the tests necessary for sight reading in the University classes in the recitations and the regular examinations:

	Marks.
30 copies of Xen. Commen. @ M. — .45	13.50
25 copies of Her., Vol. I, Lib. 1–4 @ M. 1.35	31.25
25 copies of Odys., Pars I, I–XII @ M. — .75	18.75
25 copies of Thuc., Vol. I @ M. 1.20	30.
25 copies of Plato, Abteil. V @ M. — .60	15.
25 copies of Dem., Vol. I, Pars. I @ M. — .75	18.75
20 copies of Æs. Trag. @ M. 1.20	24.
20 copies of Eur. Trag., Vol. I @ M. 1.50	30.
20 copies of Soph. Trag. @ M. 1.50	30.
20 copies of Lys. Or @ M. 1.20	24.
10 copies of Æschin. Or. @ M. — .90	9.
10 copies of Aris. Com., Vol. I @ M. 1.50	15.
	349.25
Deduct 20 per cent allowed to University Library	69.85
	279.40

Estimating the mark at 25 cents	$69 85
Binding, estimated by the Librarian at 12½ cents per volume	47 87
Total cost of texts	$116 72

I hope that at least the texts without binding may be obtained for the department.

3. The entire time of an assistant would be required should the number of students be doubled; because the Freshmen and Sophomore Classes would need to be divided each into two divisions.

Respectfully,

GEO. WOODBURY BUNNELL,
Professor Greek Language and Literature.

DEPARTMENT OF MINES AND METALLURGY.

The general expenses of this department are at present but $1,800 per year, the salary of the Professor.*

In order to complete the work of equipping the Mining Laboratory, which is already begun, a legislative appropriation of $5,000 for the next two years will be needed. This, with what has been before expended, will supply the necessary machines, apparatus, etc., for these two important departments.

Annual appropriations are needed, as follows:

Increased pay of the Professor—from $150 to $250 per month	$1,200 00 per year.
Salary of an assistant in charge of the two Laboratories, $50 per month	600 00 per year.

This department returns to the University some $250 per year, on account of fees paid by students.

DEPARTMENT OF THE ENGLISH LANGUAGE AND LITERATURE.

The present expenses of the department are:

Salary of the Professor	$3,000
Salary of Assistant Professor	1,800
Salary of one assistant to be appointed in 1886, probably	1,500
Total	$6,300

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* This has been raised to $2,400 for the present fiscal year.

It is very important that an additional instructor should be appointed in this department, whose principal work would be instruction in Elocution. A competent person could hardly be secured for less than an annual salary of $1,500. This department requires for the conduct of its lectures and recitations a number of books to be placed in the lecture rooms themselves—duplicates of books which may be found in the general library. An expenditure of $1,000, made once for all, would probably cover the requirements for a special library. An annual appropriation of $1,500 is required.

DEPARTMENT OF MECHANICAL ENGINEERING.

The present expenses of this department are as follows:

Salary of the Professor	$3,000 00
Salary of the Superintendent of the Machine Shop	1,500 00
Salary of the Assistant	400 00
Salary of a Draughtsman	200 00
Materials for use in shop	200 00
New tools	150 00
Total	$5,450 00

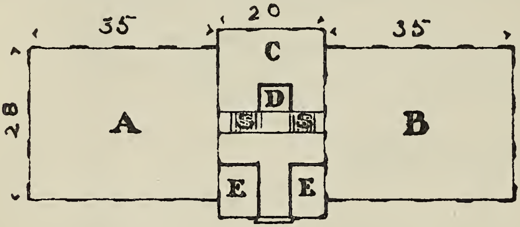
The salary of the very competent Superintendent of the Machine Shop should be raised to $150 per month, and should be paid from the General Fund. He has several times refused salaries of $200 per month, and is a highly valuable aid, who should be placed in immediate charge of the system of training of scientific students in actual mechanical work, under the direction of Professor Hesse, the head of the Department.

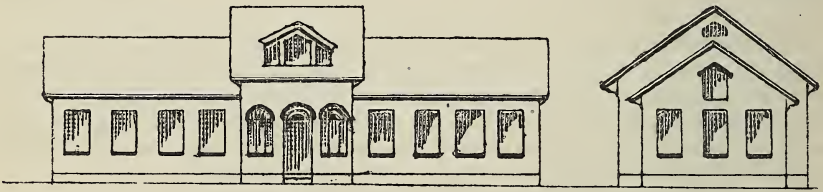
In order to make this Department fully useful, a system of elementary instruction in shop-work is of the highest importance. Unfortunately, it is impossible to fit the third story of the Mechanics' Building for this purpose. The floors of this building are too weak to carry the necessary machines. It will therefore be essential to build a small inexpensive structure back of the present building, which will provide for the accommodation of thirty-two students at a time.

A committee of the Faculties is now at work upon the question of revising the course of study in the various colleges. One of its recommendations will be that shop-work be made obligatory for at least three hours per week for the Freshman year in all the scientific colleges. Professor Hesse has prepared a plan by means of which this work can be done. It appears to be obvious that a graduate from an engineering college should have had some experience in handling all the tools—both hand and machine tools—that are used in ordinary work, and also in forging and molding. Such knowledge is necessary in nearly every position to which a mechanical or other engineer may be called in practical life. No student in mechanical engineering can become a good draughtsman or designer of machines without knowledge of this sort. The conclusion appears to be obvious that shop-work should be required from every graduate in the college of mechanical engineering, and I presume at least in the Freshman year from all scientific students. It is impossible to teach a student in these colleges anything more than the elements of such work; but the *principles* which govern all mechanical operations can be fixed in his mind in this way, and in no other. In the institution with which I am best acquainted, namely, the University of Wisconsin, eight hundred and sixty-five hours are required of all students in mechanical engineering, and the experienced and competent professors there say that this time is not too much.

Shop-work which has been done outside of the University should be credited to the student at a value of half the number of hours actually spent in the work. It should not count for more than that number of hours, because instruction in the University shops will be directed to the elucidation of mechanical principles, whereas in ordinary shops the object is to make commercial success.

. Professor HESSE's estimate for the small wooden building for such instruction, and for the necessary tools and outfit, follows:





A.—Machine shop.
B.—Carpenter shop.
C.—Smithy.
D.—Engine.
E. E.—Dressing rooms.
S. S.—Steps to second floor.

A small building, ninety feet by twenty-eight feet, containing three rooms, would cost $3,500.

One of the rooms should be fitted up for wood-working, carpentry, etc. The cost of this room would be as follows:

Benches for eight students	$160 00
8 chests of tools	200 00
4 lathes	300 00
1 planer	375 00
1 band saw	275 00
1 circular saw	150 00
1 jig saw	200 00
1 grindstone	18 00
Counter-shafting, setting up, and fitting	300 00
Materials	50 00
Total	$2,028 00

Another room to be fitted up for metal-working would cost:

Benches for eight students	$50 00
8 vises	72 00
8 sets of files	40 00
Squares, calipers, chisels, hammers, nippers, dividers, etc.	200 00
Gauges, levels	150 00
2 bench anvils	36 00
Grindstone	18 00
2 emery wheels	150 00

2 screw cutting lathes	$900 00
2 small lathes for hand turning	370 00
1 upright drill	325 00
1 planer	475 00
1 shaper	475 00
Counter-shafting, belting, setting up, etc.	450 00
10 horse-power steam engine	400 00
Steam connections	150 00
Materials, as rod-iron, machine and tool steel, sheet iron, copper and brass wire, brass rods, screws, bolts, rivets, washers	375 00
Tools: Set of taps, reamers, dies for screw cutting	170 00
Miscellaneous materials, at least	150 00
Total	$4,956 00

For blacksmith shop:

2 portable forges	$100 00
2 sets blacksmith's tools	80 00
2 anvils	28 00
Sledges, swedge blocks for welding	40 00
Sheaves	50 00
Upright drill	40 00
Total	$338 00

Fitting up the various rooms, as follows:

16 cases	$64 00
Shelves	25 00
Drawing tables	80 00
Stools	75 00
Stoves	45 00
Blue-printing cases	75 00
2 sinks	25 00
Total	$389 00

Recapitulation, is:

The building	$3,500 00
Wood-working outfit	2,028 00
Metal-working outfit	4,956 00
Blacksmithing outfit	338 00
Fitting and furniture	389 00
Total	$11,211 00

If this building is made, all the Scientific students in the University can be thoroughly trained in the elements of shop-work, and thus fitted for the professions of engineering, as they can be in no other way.

A specific appropriation of $11,211 is recommended for the introduction of shop-work training to all Scientific students.

An annual increase in the pay of the Superintendent of the Machine Shop, of $300, is required.

DEPARTMENT OF AGRICULTURE AND AGRICULTURAL CHEMISTRY.

Statement of Actual and Estimate of Prospective Expenses.

The Professor of Agriculture receives at present $3,300 per annum. This pay should be raised to $3,600. The Lecturer on Practical Agriculture and Entomology receives at present $1,800. As his duties will shortly be very much increased, this pay should be raised to $2,400. Special Lecturers on various subjects of Agriculture and Veterinary Science, etc., now receive $250. This sum should be raised to $750. The present assistant in the Agricultural Laboratory receives $1,200. His work is of a special scientific character requiring experience and ability, and his salary should be raised to $1,800. The first assistant in the Viticultural Laboratory now receives $1,200 per annum. For the same reasons his salary should be raised to $1,800. The second assistant in the Viticultural Laboratory receives at present $900. This pay should be raised to $1,000. A gardener, in charge of the agricultural grounds, should be employed in this place, at a salary of $1,200. At present, $300 per month is paid for labor on the experimental grounds, making $3,600 a year. It is desirable to undertake experiments upon many of the trees of California, and to do this, labor alone is necessary. $4,000 a year, in place of the $3,600 now expended, will probably be sufficient for this purpose.

At present, $900 per year is expended in the purchase of seeds, and for current purchases and expenses of the department. This sum should be raised to $1,200.

For the printing and distribution of bulletins of the Agricultural Department, $300 per year is now paid. This sum should be raised to $500, in order to increase the promptness with which these bulletins are printed and distributed, and in other ways to increase their usefulness and wider distribution to the people of the State. Postage upon such bulletins is now paid for at the rate of $100 per year. This postage account should be raised to $150 a year.

The expenses of the General Laboratory, which are now about $150 a year, will require to be raised to $250 a year.

The expenses of the Viticultural Laboratory alone, which are now insufficiently met by an expense of $400 per year, should be provided for by the appropriation of the sum of $600 a year.

The present expenses of the department are $14,100. If the department is to be placed on an adequate footing (as above detailed), this sum should be increased to $19,250; increase, $5,150 yearly.

UNIVERSITY OF CALIFORNIA, COLLEGE OF AGRICULTURE,
BERKELEY, October 7, 1886.

President E. S. HOLDEN:

DEAR SIR: In advance of my full report on my department, which is unavoidably delayed by the pressure of the vintage work, I beg leave to make the following statements in respect to the farther needs of the Viticultural Department, as developed by experience in work in the new building, and the increased and constantly increasing demands for information, and the investigation of practical questions.

It is now evident that, so far as the new building has advanced in construction, it fulfills very acceptably the requirements of the work. The basement rooms, when they shall be fully fitted up with necessary conveniences in the way of work-tables, shelving, etc., will be very well adapted to the purposes for which they were designed; and the sub-cellar shows all the desirable qualities as regards uniformity of temperature and good ventilation and drainage.

The superstructure also, so far as it goes, is quite satisfactory, and for its purposes—that of a chemical laboratory for the work of assistants and students—will probably be sufficiently spacious for some time to come. The funds still remaining out of the appropriation will suffice to fit it up with the most needful appliances, although only in the plainest style compatible with efficiency.

There is, however, urgent need of more room for the purposes of a viticultural museum and lecture room. At present the students' laboratory is made to subserve these purposes; but even if this use were compatible with its proper functions, the space it affords is far too limited even for what is now needed to accommodate the collections and arrange them for ready reference. There is now on the tables in this room a collection of some three hundred varieties of vines with their fruit, stems, seeds, etc. To these should be added, as soon as possible, a full collection of the grapes of each, in bunch, placed in glass jars with the proper preservative fluid. It will then be possible to identify beyond question any and all of the numerous grape varieties now scattered over the State under a multitude of synonyms, in response to the numerous calls made upon us for such determinations.

This collection alone requires extensive shelf-room and a not inconsiderable outlay for glassware. In addition, the instruction provided for by law necessitates many other specimens, such as stocks of vines as models of growth, pruning, grafting, etc. Not a particle of room for these purposes remains in the South Hall, where the agriculture lecture room is already overcrowded with the collections in general agriculture and botany. Again, a proper lecture room in which these illustrative collections are easily accessible, is manifestly a necessity.

I would therefore respectfully urge that measures be taken to obtain for these purposes from the Legislature that is to meet next winter, the means for completing the building according to the original plan, which included a museum and lecture room 25x26 feet, to be erected upon the new basement and conjoined with the present building into one, as shown in the plan approved by the Board. The building should also, as per same plan, include a spacious attic for the storage of the various articles and appliances which, being needed only for a short time each season, need not be within convenient reach; also for duplicates, etc. For this purpose, and for the inside fitting-up and more complete appliances still needed, a sum of not less than five thousand dollars should be appropriated and expended.*

Another point requiring consideration is the fact, that heretofore much difficulty and disappointment has arisen from the bad condition in which grapes shipped to us from a distance, have come to our hands. With the more ample means at command this season, through the special appropriation for work, we have successfully tried the experiment of supplying intended shippers with the best packages in the form of "basket crates," such as are used for the shipment of fruit to the East; and in most cases these packages, sent to shippers free by special arrangement with Wells, Fargo's Express, have returned to us promptly by the same agency. Thus scarcely any of the grape lots received have suffered in transportation, and the results arising from working them will, of course, be legitimately predicable as representing experiments made under normal conditions. It is obvious that this should never be otherwise; and hence I respectfully recommend that, in order to defray the additional expenses of packages and transportation by express instead of freight trains, the current appropriation for viticultural work be increased from $3,000 to $3,500 per annum.

Very respectfully,

E. W. HILGARD.

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*It will be remembered that the appropriation of $10,000 originally intended for the above purposes and placed under the joint control of the Board of Regents and of the State Viticultural Commission, was by subsequent agreement equally divided between the two bodies, they failing to agree as to the actual joint use.

DEPARTMENT OF INTELLECTUAL AND MORAL PHILOSOPHY AND CIVIL POLITY.

At present the expenses of this department are $4,000 per year; the salary of the Professor paid from the Mills endowment.

The department is and should be a growing one, and in order to provide for the needs for the next few years, an assistant must soon be appointed, at a salary of $2,400 per year. No increase for this purpose is asked for at present. But there is immediate need of providing for the special *materiel* indispensable to the department. This is an adequate collection of the literature bearing on its topics. Such a collection is a necessity to the department in a degree not true of any other. The literature of philosophy is, in a peculiar sense, the substantive material of its investigation. Its library thus stands to the department in a relation quite identical with that borne to the Departments of Physical and Natural Science by their laboratories and apparatus. The department exists, thus far, by the munificence of a single honored citizen of California, who has endowed it with a fund now amounting to $87,000, which, under the careful management of the Regents, will, in a few years, reach the sum of $100,000. This fund, however, by the judicious provisions of its donor, is devoted exclusively to maintaining the salary of the Professor in charge. In view of this disinterested gift, hitherto without an equal, for its special purposes, in our country; and in view, also, of the fact that its need and usefulness in the University are attested by the very large attendance of students on the courses provided under the gift; it would seem most fitting that the State should supplement the benefaction by immediate measures towards providing the implements necessary to the complete performance of the work contemplated by the donor. For these reasons an appropriation of $10,000 is respectfully asked for, to be applied to the general purposes of a special library for the department.

DEPARTMENT OF MILITARY SCIENCE.

At present the Department of Military Science is provided for by the pay of the army officer detailed by the Government as the head of this department.

A small appropriation for expenses has been made of $200 per year. This appropriation should be continued and need not be increased.

The Gymnasium should be placed in charge of the Military Department, and an Instructor in Gymnastics appointed at a salary of $1,200 per year. This is elsewhere spoken of.

ARMORY.

The armory should be removed from the basement of North Hall, where it seriously interferes with the proper use of that building, and should be established in the basement of the new portion of the Gymnasium, or in a separate building. An appropriation of $1,000 is asked for to this end.

GYMNASIUM.

The Gymnasium should be placed under the control of the Department of Military Science and Tactics, and a proper Gymnasium Instructor should be obtained at a cost of $1,200 per year.

At present the gymnasium repairs are paid for by a tax upon the individual students. It would appear to be better that the University should assume this taxation at a cost of $300 per year, making the total proposed additional cost of the Gymnasium $1,500 per year.

The state of physical instruction in other colleges may be understood from the following memorandum which Assistant Professor EDWARDS has prepared:

NOTES ON PHYSICAL EDUCATION IN COLLEGES AND UNIVERSITIES IN THE UNITED STATES.

The objects of the following memoranda are:

1st. To set forth the recognized need of physical education in Colleges and Universities.

2d. To show that there is among educators a growing interest in it.

3d. To exhibit the fact that those who most need systematic and intelligently directed exercise are those who will not take it unless required to do so.

4th. To call attention to the need of examination by a competent physician, and the need of proper direction in exercise.

5th. To suggest the need of instruction in Physiology and Hygiene for College students, whose health is in danger of being impaired at their time of life.

6th. To direct attention to the fact that the new system calls for apparatus for special development, involves no personal risk, and to a great extent discards what might be termed trick apparatus.

7th. To suggest that Departments of Military Science and of Physical Training may be made coördinate.

UNIVERSITY OF PENNSYLVANIA, Philadelphia, 1,028 students. J. W. White, M.D., Director of Physical Education.

Dr. White says: This department carries into practical operation the conviction that during the period of growth the body needs quite as much training as the mind, and that a college that holds out incentives to intellectual progress should not overlook the bodily progress, without which all mental prizes, when won, are useless.

Impressed with the belief that those who seek to develop the mind should also exercise a supervision over the body, the University has instituted this department, and through the liberality of the city, and the zeal of the alumni, has provided the *means* and the *system* for the due care and development of the physical education of its students.

The *means* are supplied in the athletic grounds given by the city, and adjacent to the University buildings.

* * * * * * * * *

A boat house on the Schuylkill.

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And a gymnasium wherein are found all the latest appliances for the proper development of the body.

* * * * * * * * *

The *system* consists in direct personal individual care of each student, who immediately after entrance to college receives a thorough physical examination, and is then advised by the Director of the Department as to the particular needs of his body; this advice being founded upon a careful study of his present condition, personal and family history, taking into account any hereditary predisposition to disease.

The record is annual.

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Merely competitive sports do not supply the demands. Some men, naturally athletic and fond of exercise, need to be guided and directed, sometimes restrained; others, of sluggish temperament or of too studious habits, must be stimulated: all require to have their work, whether voluntary or compulsory, directed by proper methods, so that the result may be a harmonious and symmetrical development of the entire organism. * * * Attendance is not compulsory.

President Eliot, of Harvard, writes: In general the department of hygiene and physical training is in good condition; the Hemenway Gymnasium is more used, and more intelligently used, every year; and during the Spring and Fall the river and the ball fields invigorate and refresh hundreds of young men who will greatly need in their after lives all the strength and soundness here acquired or preserved. * * * * * *

The Gymnasium is supplied with eight hundred and thirty-one lockers, an insufficient number. * * * * * * * * * *

The corporation recently gave $1,000 to help prepare new ball grounds and a running track.

What is much needed is a swimming bath and inclosed tennis courts.

The gymnasium is furnished with the best patterns of ordinary gymnastic apparatus, and with many new appliances designed to develop the different parts of the body, and so constructed that they can be accommodated to the strength of the strong, or to the weakness of the weak.

Facilities for recreative exercise have been provided in the bowling alleys, the ball court, and in the rowing, fencing, and sparring rooms.

The gymnasium is open to all students of the University on week days, from 11 A. M. until 1 P. M., and from 3 until 5:30, and from 8 until 10 P. M., except on Saturdays, when it is closed at 1 o'clock.

The attendance is voluntary, and the system adopted is one designed to meet the special wants of each individual. Realizing the great diversity in age, size, and strength, as well as in health, of the students who attend the University, the Director makes no attempt to group them into classes which pursue the same course of instruction.

Upon entering the University each student is entitled to an examination by the Director, in which his physical proportions are measured, his strength tested, his heart and lungs examined; and information is solicited concerning his general health and inherited tendencies. From the data thus procured a special order of appropriate exercises is made out for each student, with specifications of the movements and the apparatus which he may best use. After working on this prescription for three or six months the student is entitled to another examination, by which the results of his work are ascertained and the Director enabled to make a further prescription for his individual case.

Lectures on physiology and hygiene are also given by the Director.

A course of informal lectures is given by the Director, in which the theories and principles of physical training are practically illustrated.

AMHERST, three hundred and thirty-four undergraduates.

In the Department of Hygiene and Physical Education, instructions in the fundamental laws affecting the health of students is given early in the Freshman year. In order to understand how to care for the health, the student must be taught the structure and use of the body; and a course of lectures and recitations on human anatomy and physiology, illustrated by models and veritable parts of the body, is given during the Sophomore year, to meet this necessity. At the same time, this instruction is expected to form a suitable foundation for the subsequent instruction in comparative anatomy and physiology.

The department of hygiene and physical education is under the charge of two physicians, who are expected to be informed with regard to the health of all the students.

Each student, soon after he enters college, and twice thereafter during his college course, is minutely examined in reference to his strength and physical condition, and advised as to the particular course he should take for the maintenance and increase of his health and strength. A chart of standard measurements, together with a record of his own measurement, is given him, and he is directed to the most advantageous use of the ample appliances with which the Pratt Gymnasium is provided.

Besides the exercises which every student may take by himself, the members of each class *regularly* exercise together in the gymnasium every week day, excepting Wednesday and Saturday. Unless excused for physical disability, the attendance of every student is *required* at the gymnasium for the performance of exercises in light gymnastics.

The *results* of the system of prescribed gymnastic training, pursued in the college, have been eminently satisfactory.

While physiologists affirm that, as a general rule, the health of a young man from fifteen to twenty-five years of age is apt to decline, the reverse rule is found to prevail with the students here. From statistics systematically kept for more than twenty years, it appears that the health of an Amherst College student is likely to grow better each year of his collegiate course. The average health of the Sophomore Class is better than that of the Freshman, and the Junior better than that of the Sophomore, and the Senior Class best of all. This average, moreover, is shown to come from the improvement in the physical condition of the individual student, and not from those dropping out of the course who might be too weak to complete it.

WASHINGTON UNIVERSITY, three hundred and forty students.

During the summer of 1880 a gymnasium was erected and furnished on the University grounds, at a total cost of ten thousand dollars.

The large hall, fifty by seventy and nearly thirty feet high, is unsurpassed by any gymnasium in the city. It is heated by steam, and supplied with all necessary apparatus.

While encouraging and requiring systematic and wholesome exercise, the University does not wish to foster an undue interest in the feats of athletes, and discourages exercises which involve personal risk to the performers. All class exercises are conducted by a professional instructor.

DARTMOUTH, four hundred and twenty-seven students.

The gymnasium, erected by the munificence of George H. Bissell, of New York, at an expense of $24,000, is supplied with all necessary apparatus. It is opened daily for the use of the students; and during the second term a regular exercise is required, under an instructor.

BOWDOIN.

The Boards, at their last meeting, voted to build a gymnasium, which is now in process of erection.

The plans have been approved by Dr. D. A. Sargent (Bowdoin, 1875), Director of the Hemenway Gymnasium of Harvard, who has kindly promised to furnish a complete set of the most approved apparatus, as his contribution towards its erection.

CORNELL.

President White:

So impressed has your Executive Committee been with the importance of the military department and the need of physical training that they have erected a large building, to be used partly as a hall for military drill, partly as a gymnasium, and from time to time for large public gatherings upon the University grounds, especially for those of the annual commencement. This building is now completed, and will be this day submitted to your inspection. The entire amount of expenditure upon it, with its annex embracing retiring room for faculty and students, offices, room for repairing arms, bathrooms, storage rooms for gymnastic apparatus, etc., with steam heating for both structures, will be about $35,000.

In close connection with the building just referred to, comes the subject of provision for physical training. For some time past there has been provision in a small temporary gymnasium for the students at large and in a suitable room at Sage College for the lady students. But its inadequacy has been generally felt, and during the past year your Executive Committee have had a very careful study made, and a report prepared upon this subject. In order to make this study Professor Burbank was sent to visit the principal gymnasiums at other Universities and Colleges, and to confer with persons giving gymnastic instructions. As a result of his report, the committee have made the provision above referred to in connection with Military Hall, and have purchased a large amount of the most approved gymnastic apparatus. But what is still more important, they have decided upon what they believe to be the best system for promoting physical culture among the students.

This side of instruction has, in days gone by, presented considerable difficulties. On one hand, many of the best students have taken too little exercise—thus developing their minds at the expense of their bodies—and what the results of this mistake are, is too well known throughout our country. On the other hand, too much exercise has been taken without direction or supervision, resulting at times in serious injury. Your committee have thought it best to adopt the system which has produced such excellent results at Harvard University. They propose that there be placed in charge of all the physical training of the University, a professor of Physical Culture, who shall be both a regularly educated physician and trained gymnast; that *every* student who enters the University report to him, submit to an examination, and take such general course of exercise as he may prescribe, subject to rules laid down by the Trustees and Faculty. In thus prescribing, the professor would naturally be guided by the physical characteristics of the student and by his inherited tendency. Thus the exercise prescribed for the sturdy young man of strong frame, would be different from that assigned to a young man of sedentary habits and delicate constitution. So too, the course prescribed for a young man of robust parentage would be different from that of a young man inheriting tendency to disease of heart or lungs.

It is believed that under such a system it will be found here, as it has been found elsewhere, that the power of students intellectually, as well as their chances of usefulness in after life, will be increased.

Until the proper person is found for such a professorship, it will probably be wisest to secure the best man possible, acting as an Instructor in subordination to the Professor of Military Science and Tactics, whose influence upon the physical training of the University has been so useful to us for the past six years.

Beloit, two hundred students.

The gymnasium *recently* erected, furnishes facilities for the physical exercise of the students, arrangements for which are *systematized* under the *direction* of the Faculty.

Haverford, ninety-three students.

Director of the Gymnasium, Dr. W. A. Ford. The gymnasium was refitted early in 1881, with the apparatus of Dr. D. A. Sargent, Director of the Hemenway Gymnasium of Harvard University. A competent teacher, a graduate of Jefferson Medical College, and a pupil of Dr. Sargent, has direction of it, and gives systematic instruction, based upon careful personal examination, to each student desiring such aid.

Regular work in the Gymnasium is *required* of all members of the Sophomore and Freshman classes.

BROWN UNIVERSITY, two hundred and thirty-seven students.

The corporation appropriates $400 a year for the rent of a Gymnasium Hall, for the *exclusive* use of the students of the University. Students have access to this Gymnasium upon payment of a moderate assessment to the Students' Gymnasium Club.

SMITH COLLEGE—for women—two hundred and sixty-five students.

In addition to lectures on Physiology and Hygiene, there are *regular* exercises in light gymnastics, in a gymnasium provided for the purpose. The exercises are accompanied by music and are under the charge of a competent teacher. They are designed to bring the muscles into symmetrical action by agreeable methods, and they aim to secure not only health, but also graceful carriage and well formed bodies.

OBERLIN, one thousand three hundred students. About equal numbers of men and women.

The ladies' gymnasium has been improved and fitted up under the direction of Dr. D. A. Sargent, Director of Harvard Gymnasium. The apparatus includes chest weights, clubs, horizontal bars, dumb bells, chest expander and neck machine. The work in the gymnasium is supplemented by regular outdoor exercise. A resident director, who studied with Dr. Sargent, has constant supervision.

ILLINOIS INDUSTRIAL UNIVERSITY, two hundred and thirty students.

The drill hall is furnished with a full set of apparatus, and *classes* in gymnastic exercises are organized in the Fall and Winter terms under careful leaders.

JOHNS HOPKINS UNIVERSITY, two hundred and ninety students.

A committee consisting of the President, two members of the Board of Trustees, the Professor of Biology, and the Director of the gymnasium (E. M. Hartwell, M.D.), has charge of the gymnasium. All undergraduate students are required to take a course in physical training, as is prescribed for them by the Instructor in that subject.

The University Gymnasium is planned to meet the requirements of two hundred and fifty persons. The main building is one hundred and four feet in length, and the wing, with dressing and bathrooms, is about eighty-five feet in length. The Instructor is present at the gymnasium through each day, to advise and direct the exercises of the students. Sargent's apparatus has been provided.

UNIVERSITY OF WISCONSIN, four hundred students.

Military drill is required of the Freshman and Sophomore classes. A well furnished gymnasium and two bowling alleys are open to the students at fixed hours. The University is situated on the shores of Lake Mendota, and the student can find relaxation and exercise in boating.

WILLIAMS COLLEGE, two hundred and fifty-three students.

The new gymnasium, the second valuable building erected here through the munificence of Honorable John L. Goodrich, of Stockbridge, is now completed and fitted up with the apparatus formerly in Goodrich Hall, and furnished with every facility for the physical exercise of the students. The bowling alley in the lower floor of Goodrich Hall, will for the present, under certain restrictions, remain accessible to the students.

The President meets the Freshman Class several times during the first term, giving them such practical instruction as to health and habits of study, as seems to him suitable to the needs.

Wellesley College—for women—four hundred and eighty-five students.

The gymnasium has been improved and fitted up under the direction of Dr. D. A. Sargent, and by use of his system of physical training, is conducted on a strictly scientific basis; the amount and manner of exercise being carefully prescribed and directed according to the needs of each individual. The apparatus is very complete and includes a great variety of mechanical arrangements for special work. There is an opportunity for those students, who wish, to take special training in addition to the work required by the College.

All work in the gymnasium, required or elective, is under the constant supervision of a resident director, who studied with Dr. Sargent, and who has had several years successful experience in teaching gymnastics.

Vassar College—for women—two hundred and seventy-five students.

The health of the students is made a prime object of attention.

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Students are required to take invigorating exercise for a given period every day. Frequent lectures on hygiene are given by the resident physician.

The grounds cover 200 acres and afford ample facilities for exercise in boating, skating, horseback riding, tennis, etc.

There is a large gymnasium supplied with all the requisites for physical training. Each student is *required* to take exercise in the gymnasium under the direction of the teacher of gymnastics. Examination is made by spyrometer and dynamometer, and such a diagnosis of each student's physical condition as is necessary to determine the amount and kind of exercise and the nature of gymnastic training required in each individual case. This is conducted by a resident physician. Instruction in gymnastics is given according to the system in use at the Hemenway Gymnasium at Harvard University.

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Vanderbilt University, four hundred and eighty-seven students.

The gymnasium is a brick building 90x60 feet, substantial and of handsome architectural design. It has a basement containing dressing and bathrooms, and rooms for general exercise and training, and visitors galleries accessible from the exterior by winding stairways in two of the towers.

The principal story is a single room for general exercise 80x40 feet, with ceiling 32 feet high. It contains a running and a walking track, and a complete equipment of gymnastic apparatus, comprising: rowing machines, chest expanders, clubs, dumb-bells, etc.

Northwestern University.

A large and well appointed gymnasium, under the care of a competent director, stands on the College grounds. Students are classed according to strength and proficiency in gymnastic exercises, and receive class instruction twice a week. The gymnasium is open for voluntary exercise, and the Director is in attendance to give general oversight from 8 A. M. to 6 P. M. each day. Special hours are reserved for the use of lady students, who, as well as the young men, are given class and individual instruction.

College of New Jersey, Princeton, five hundred and nineteen students.

The gymnasium was built in 1869 by Mr. Robert Bonner and Mr. Henry G. Marquand. It is thoroughly equipped with all the apparatus necessary or a complete physical training. It has hot and cold shower and plunge baths, dressing room, bowling alleys, and besides the main hall, a room for baseball practice. There is also a gallery for visitors. The gymnasium is open from 7 to 8 A. M., 12 M. to 1:30 P. M. During the second term, exercise in the gymnasium is required of all members of the Sophomore and Freshman classes *three* times a week; the remainder of the year attendance is optional. Classes in the use of Indian Clubs and Calisthenics are held every day during the noon and afternoon hours. These exercises are adapted to all grades of strength, and are such as to maintain and improve in health all who take part in them; health being the primary and strength the secondary object of exercise. Special exercise on the various apparatus is under the personal supervision of the Superintendent, who is also at the command of any student for advice in regard to physical development and the laws of health. During the winter term there is an out-door athletic meeting for prizes; in the spring there is a gymnastic contest also for prizes, and at commencement a gymnastic exhibition.

UNIVERSITY OF MINNESOTA, three hundred and ten students.

The military building, completed in 1884, is the largest drill hall in the country, and is so constructed as to serve the additional purpose of a gymnasium and of a large assembly hall. It will seat with comfort five thousand people.

The subfreshmen, and all new students, are required to attend a short course of lectures on personal hygiene and the laws of health. The topics are such as: soils, water, air, food, clothing, habits, etc.

A course of lectures on Sanitary Science is offered to the Seniors of all departments the second term. The topics embraced are such as: water supply and drainage of towns; heating, lighting, and ventilating dwellings and public buildings, epidemic diseases, etc.

By authority of the Board of Regents, Professor Hewett has organized a system of physical examinations designed to collect and preserve the health history of each student during his connection with the University.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

The large drill hall includes a gymnasium, used by all classes in the Institute.

LEHIGH UNIVERSITY, one hundred and eighty-seven students.

The new gymnasium is a handsome and spacious structure, built and equipped with the utmost thoroughness. It is furnished with the best patterns of apparatus, adjustable to the physical powers of the student. The bathing arrangements are complete, and the dressing accommodations ample. Opportunities for recreative exercises are provided in a bowling alley, billiard, fencing, and sparing rooms. It is under the care of a competent Director, who gives instruction in classes, and also meets the special wants of each individual.

DEPARTMENT OF MINERALOGY, PETROGRAPHY, AND ECONOMIC GEOLOGY.

This department is at present under the charge of a Professor whose salary is only $1,800 a year*. This salary should be raised to $3,000 a year. This department requires the services of an assistant at $600 a year, for the purpose of preparing thin sections of rocks for study, and for assisting in the care of the collections, as well as for beginning the much-needed mineralogical survey of the State.

The Museum of the Department of Mineralogy, etc., does not grow because there is no fund at present available for the purpose of making exchanges of specimens between that department of the University of California, and similar departments of Eastern colleges. A sum of $600 a year should be set aside for such exchanges, and for the increase of the Museum.

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*This salary has been increased to $2,400 for the fiscal year 1886–7.

A Museum of Technical Geology to illustrate the building stones, the artificial stones, clays, brick, limes, mortars, cements, mineral paints, etc., should be formed for the use of this department jointly with that of Civil Engineering. A sum of $200 a year is required in order to transport such specimens as will be presented to us from the place of their origin to the University. Besides these annual expenses, a sum of $1,000 should be set apart for the commencement of the Museum of Technical Geology by the purchase of the more important and expensive specimens, and a sum of $1,000 should be appropriated for a collection of crystal models, and for miscellaneous physical and chemical apparatus required in the work of the department.

The Museum of Petrography has been increased by the purchase of a small collection of American rocks, and of a portion of a collection of European rocks, from the last legislative appropriation for the Department of Geology. The rest of the European collection could not be obtained for lack of time before the end of the fiscal year in 1887. An appropriation of $850 is needed to complete the collection of European type-rocks.

The Museum of Economic Geology, which should contain a suite of specimens illustrating the mineralogical composition, wall-rocks, and geological peculiarities of every important mine in the United States, and of the leading mines of Europe, has been hardly more than projected. It contains collections from a few California mines, obtained personally by the Professor in charge, and from a few other mines, donated by the friends of the institution. The collection is one of the most important, both from educational and scientific points of view, that the University should make, and at least $5,000 should be appropriated for obtaining by purchase the material that cannot be personally collected by the Professor.

Such a collection would find its most important use in immediate connection with the instruction of our Mining students in the special branch of Mining Geology.

Thus this important department should have specific appropriations, as below:

For purchase of the more expensive specimens for a nucleus of the Museum of Technical Geology	$1,000 00
For purchase of a collection of crystal models and apparatus	1,000 00
For purchase of collection of European type-rocks	850 00
For purchase of collection for Museum of Economic Geology	5,000 00
Total	$7,850 00

Annual appropriations are needed, as below:

Increase of Professor's salary	$1,200 00
Assistant in charge of Museum, etc.	600 00
Freight on exchanges of minerals	600 00
Freight on specimens for Museum of Technical Geology	200 00
Total	$2,600 00

DEPARTMENT OF THE LATIN LANGUAGE AND LITERATURE.

The expenses of this Department are: Pay of the Professor, $3,000. The Instructor in Latin is also Instructor in Greek, and is employed at a salary of $1,500 a year; making the total expenses of this Department $3,750 a year. ($3,000+$750.)

The whole time of one Instructor is needed in this department additional to the services of the Professor, making the prospective expenses, $4,500 per year. Increase $750 yearly.

DEPARTMENT OF PHYSICS.

The present annual expenses of the Department of Physics is as follows:

Salary of the Professor of Physics	$3,300 00
Salary of an Assistant to aid in lecture experiments	300 00
Annual expenses for repairs and purchase of small articles	100 00
Salary of the Assistant Professor of Physics	1,800 00
Annual appropriation covering the cost of perishable material used in lectures, etc.	250 00

A small amount of credit to the department is obtained by remission of laboratory fees. The present total annual cost of the department is $5,750.

In order to bring this department up to its proper efficiency, the pay of the assistant (to the Professor), which is now $300, should be raised to $600, in order that the whole time of the assistant can be commanded. A graduate assistant should also be provided for the Physical Laboratory, in order that the valuable time of the Superintendent should not be wasted in merely mechanical operations.

The sums set apart for the purchase of perishable material, etc., namely $100 and $250, for the physical lectures and for the Physical Laboratory, respectively, are not sufficient. In the increase of equipment in Experimental Physics, $250 per year should be allotted. In the increase of equipment and the current development and repairs of apparatus in the Physical Laboratory, $500 per year are needed. An increase of $1,650 per year is thus required.

DEPARTMENT OF BIOLOGY.

This very important department should be at once endowed. It will have relations to the undergraduate and graduate work at Berkeley, and will be of the greatest importance in the studies of students of the Medical and Dental Schools in San Francisco. A suitable head of this department can hardly be obtained for a less salary than $3,600. He will require a laboratory assistant at $1,200. A janitor and assistant at $600 should be attached to this department. Thus the annual appropriation would need to be $5,400.

It will be necessary to establish a working biological laboratory at Berkeley, at a cost not to exceed $5,000, for the room, apparatus, and the beginnings of a collection. This item to be met once for all by a specific appropriation.

I venture to give below the substance of the remarks made by Professor Joseph Le Conte, at the dinner of the Alumni of the University of California, June 30, 1886. These extracts present the whole case in its broadest form:

"The University may be compared to an organism. Like an organism, it consists of many parts, performing different functions, and all coöperating for the life of the whole. Like an organism, it was not made at once, out of hand, but has grown from small beginnings by a process of evolution. Like an organism, external conditions may help or hinder its healthy growth. It is important, then, that we should understand its life history, so as to help, when necessary, its development. If it be asked, then, what is the next step in the normal evolution of our University? I answer, unhesitatingly, the *endowment of a chair of Biology, with its accompanying laboratory and marine station.*

In every subject there are two questions for scientific solution: the first is a question of "*things as they are*," the second a question of "*how they became so.*" This latter is a question of *evolution.* Thus, for example, the animal body may be studied as to its parts, the functions of these parts, and the manner in which all coöperate for the life of the whole: this is *Physiology;* or it may be studied in the gradual process of becoming what it is: this is *embryology*, it is *evolution.* Again, society may be studied in all its parts, the social functions of these parts, and the manner in which they coöperate to produce peace, prosperity, and good government: this is social statics; or else the same may be studied in its gradual development from the lowest savage to the most complex civilized condition: this is social progress, social development, *social evolution.* So, again, the earth may be studied in its parts, land and sea, rivers and mountains, currents of air and water, and the manner in which these coöperate to produce the present climates and other physical conditions: this is Physical Geography; or else the same may be studied in the gradual changes in all these toward the present condition: this is *Physical Geology*, it is *terrestrial evolution.* The same is true of *every* department of nature; and thus it would seem that *evolution constitutes one half of all science.* If this be so, ought not one half of all our scientific teaching be in this direction?

But it will be objected that this side of science is yet in a chaotic condition; that the universal sway of evolution is not admitted. Evolution is still an unproved hypothesis. I freely admit that this is true of any *special form* or *theory* of evolution, whether Darwinian, Spencerian, or Haeckelian. I admit that evolution, as a *special school of thought*, with its following of disciples, as a formulated *scientific creed* with its faithful believers, is still on trial. But evolution in its wider sense, as a law of progressive movement, affecting alike every department of nature, and especially evolution as a universal *law of derivation* of new forms from previous forms, is certain. It is more—*it is axiomatic.* It is only necessary to conceive it clearly to see that it is a necessary truth. As this may seem paradoxical to some, I stop to explain: Physical *phenomena*, we all admit, follow each other as a continuous chain, each derived from a preceding as its cause, and giving origin to a succeeding as its effect. This is the *law of continuity*—the law of necessary *causation.* It might well be called a law of *derivation.* We all admit this is axiomatic—a necessary condition of rational thought. So also material *forms* follow each other in continuous chain, each derived from a preceding, and giving origin to a succeeding form by a law of continuous derivation. Here also is a law of continuity—a law of necessary causation. In fact, it is naught else than the *law of causation applied to forms instead of phenomena.* This also, therefore, is axiomatic, *i. e.*, a necessary condition of rational thought. As phenomena may be sometimes inexplicable, but we never think of doubting that they have a natural cause, because to doubt would be to doubt the validity of reason and the rational constitution of the universe; so also the origin of *new material forms* may be often inexplicable, but we ought not therefore to doubt their origin by natural process, because to doubt is to doubt the validity of reason and the rational constitution of the universe.

It must be admitted, then, that the law of evolution in this wide sense is a legitimate field of scientific thought. It is, in fact, nothing more than the scientific *mode of thinking about the origin of things* in all departments of nature, and therefore must constitute one half of the whole domain of science, and ought to have, to say the least, a very large share of our scientific course. Now, what is the fact in this regard. Of the two halves of scientific domain, one half is represented by Mathematics, Mechanics, Physics, Chemistry, Astronomy, Engineering, Civil, Mechanical, and Mining, and the other half by but one chair—my own. Am I not right, then, in thinking that the next great step in the development of our University must be an expansion on this side of scientific thought? And how else can we begin but by endowment of a laboratary, in which that simplest form of evolution—embryonic development may be directly observed? *Biology is indeed the basis of this whole side of scientific thought*, as Mathematics and Mechanics is of the other.

I leave the subject to the affectionate interest of the Alumni and the deliberative wisdom of the Regents, with the full confidence that it is only necessary to see clearly in order to accomplish speedily."

DEPARTMENT OF GEOLOGY AND COMPARATIVE PHYSIOLOGY.

If the changes spoken of above are carried out, the present Chair of Geology and Natural History will be separated into two: First, Department of Geology and Comparative Physiology. Second, Department of Biology (Physiology, Anatomy, Histology, etc.).

The Department of Geology and Comparative Physiology will require, besides the salary of the Professor—namely, $3,300 already provided for—an annual appropriation of $500, for the ordinary current expenses of the museums and laboratories connected with this department.

Some improvements in the museum facilities of this department are imperatively needed, but can be delayed for another period of two years. The annual increase asked for is thus $500.

MUSEUMS OF THE UNIVERSITY.

The liberal appropriations of the last Legislature have supplied the museum with cabinets and cases, and the unsatisfactory condition of last year has been removed in great measure, and a large part of the museum material is now in due form, particularly that part used in class teaching. For want of *area*, our museum is not so satisfactory as a public exhibition; there is not sufficient passage-way between the cases, nor is there standing room for the cases.

In all museums where show and study are combined, two sets should always be provided, and arranged in different styles. The working collections for study should occupy cabinets, and the exhibition specimens in glass cases. An increase of area is the only way out of this congested condition. A large amount of valuable material cannot be displayed nor made use of in instruction, on account of lack of room. A new museum building to cost not less than $100,000 will eventually be required. At present, no additional expense is required, except the raising of the Curator's salary from $1,200 per year to $1,500, and providing a fund of $1,000 per year to pay for exchanges, and for care of the collections, making the total proposed cost of this department $2,500.

At present we do not obtain many valuable gifts, simply because the University has no funds to pay for transporting these from the donors to Berkeley.

The University has again to acknowledge the continued liberality of

Wells, Fargo and Co.'s Express, which has transmitted many specimens for our museums, free of all cost to us.

The additional annual appropriation required is therefore:

Increase of Curator's salary	$300 00
Fund for care and increase of collections	1,000 00
Total	$1,300 00

DEPARTMENT OF HISTORY AND POLITICAL ECONOMY.

The present cost of this department is:

Salary of the Professor	$3,000
Salary of one Instructor	1,800
Salary of Instructor to be appointed in July, 1886	1,500
The total cost	$6,300

With this force the present work of the department can be done satisfactorily. In order to make a perfect school of Political Science, the Chair of History and Political Economy must, eventually, be divided into two, making a department of history and a separate department of political science. Two instructors, as at present, will probably suffice for the teaching force in addition to the two Professors. No *increase* is asked for in this department at present.

DEPARTMENT OF THE FRENCH AND SPANISH LANGUAGES AND LITERATURES.

The present cost of this department is simply the salary of one Professor, namely, $2,400 a year.

This important department should be put on a proper footing by the employment of an Assistant Professor of the French and Spanish Languages, at a salary of $1,800 per year. An increase of $1,800 is required.

DEPARTMENT OF THE GERMAN LANGUAGE AND LITERATURE.

The present cost of this department is:

Salary of one Professor	$2,400 00

It is proposed to employ an assistant in German in July, 1886, at a salary of, say $1,500 a year. The increase in this department is, therefore, $1,500, which, although provided for in 1886, must be met by an appropriation, as the present funds of the University cannot be depended upon to meet it in the future.

DEPARTMENT OF CHEMISTRY.

The present cost of the department is:

Salary of the Professor	$3,000 00
Salary of one Instructor	1,500 00
Salary of two assistants at $600	1,200 00
Total	$5,700 00

The services of an Assistant Professor in this Department are imperatively required, and the Assistants are much underpaid. If the Department is placed upon a suitable footing the expenses would stand:

Salary of the Professor in general charge of the Department	$3,000 00
Salary of an Assistant Professor in charge of Quantitative Laboratory	1,800 00
Salary of two Assistants, at $1,000 each; one in charge of the Qualitative and General Laboratories; the other in charge of the storeroom and of the manufacture of pure reagents, but both giving regular instruction	2,000 00
General apportionment for the Chemical Laboratory per year—supplies, materials, etc.	1,800 00
Total	$8,600 00

A large portion of this last item of $1,800 is annually returned to the University by the payment of fees by the students, the average fees being about $1,000 per year.

An annual appropriation of $2,900 is thus required to make this very practical Department thoroughly efficient. A new chemical laboratory building is required, which is spoken of above, and whose cost can be met by a specific appropriation once for all.

DEPARTMENT OF CIVIL ENGINEERING AND ASTRONOMY.

The present cost of this department is:

Salary of the Professor	$3,000 00
Salary of the Instructor	1,500 00
Total	$4,500 00

In order to place the Department of Civil Engineering and Astronomy on a proper basis, it is necessary to have a Professor of Civil Engineering and Astronomy at a salary of $3,000, as at present; an Assistant Professor of Engineering and Astronomy, at $1,800; an Instructor in Drawing, $1,200; a janitor for the Civil Engineering Department, and for the Meteorological Observatory, $600; and an appropriation of $400 per year for the repairs of surveying instruments, purchase of surveying stakes, and small articles used in the field, etc., as well as surveying instruments themselves.

That is, an increase of $1,900 in the annual cost of this Department is required. (The Janitor's salary is elsewhere included.)

DEPARTMENT OF MATHEMATICS.

The present cost of the Department of Mathematics is:

Salary of the Professor	$3,000 00
Salary of two Assistant Professors at $1,800 each	3,600 00
Total	$6,600 00

No additional Instructor in Mathematics is required in this Department.

A collection of mathematical models is needed, to be used jointly by this Department and the Department of Drawing. This collection could be had for $1,000, to be paid for by a specific appropriation.

DEPARTMENT OF ORIENTAL LANGUAGES AND LITERATURES.

Until the Tompkins fund becomes available for the support of the Agassiz Professor, it is not possible to offer courses in the Oriental Languages and Literatures.

DEPARTMENT OF DRAWING.

The duties of the Department of Drawing are to provide a general course of drawing instruction suitable for students in the scientific departments; three special courses to correspond with the departments of Mechanical Engineering, Mining Engineering, and Civil Engineering must also be given. The only Instructor in this branch now receives $1,500.

This work can be properly done under the charge of an Assistant Professor of Drawing, at a salary of $1,800, and of an Instructor in Freehand, Architectural, and other drawing, at a salary of $1,200.

In common with the Department of Mathematics, a collection of mathematical models should be purchased, at a cost of about $1,000. This is estimated for elsewhere. Increase asked for this department, $1,500 yearly.

DEPARTMENT OF GENERAL AND ECONOMIC BOTANY.

It is important that a separate department of General and Economic Botany should be formed, and that a Professor of Botany should be appointed, at a salary of $3,000 a year. He will require an assistant, for the purpose of taking charge of the herbarium and aiding in the instruction of the classes, at $600 a year. The collections of the department should be very greatly increased by exchange and otherwise, and the formation of a large herbarium should be seriously begun. The annual expenses for some years to come will be at least $200 a year.

The cost of the Department of Botany then should be $4,100 per year. At present $900 a year is spent in the payment of a lecturer, for giving certain courses of lectures in this subject. An appropriation of $3,200 yearly is required for this department.

THE LIBRARY.

In order to make the library a thoroughly good working collection, considerable additions should be made to the number of books now available. Especially it is necessary to provide for the adding of many scientific journals which give the progress of different departments of science and art from day to day. Besides periodicals, books are needed for the:

Department of Greek	$400 00
Department of Mining and Metallurgy	800 00
Department of English and English Philology	2,000 00
Department of Mechanical Engineering	500 00
Department of Agriculture and Agricultural Chemistry, including Viticultural Works	500 00
Department of General and Economic Botany	500 00
Department of Intellectual Philosophy	10,000 00
Military Department	100 00
Department of Latin	500 00
Department of Philology	500 00
Department of Physics	500 00
Department of Geology	300 00
Department of Biology	1,000 00
Department of History	500 00
Department of Political Economy	500 00
Department of German	300 00
Department of Chemistry	800 00
Department of Civil Engineering	500 00
Department of Astronomy	500 00
Department of Mathematics	500 00
Department of Oriental Languages	500 00
Department of Drawing	100 00
Department of Mineralogy, etc.	500 00
Department of French	500 00
Department of Spanish	500 00
Department Library (Bibliography)	100 00
Total	$23,300 00

A specific appropriation of $23,300 should be made to bring the library up to its proper standard. This appropriation need not be made at once, but could be given half in 1886, half in 1888. Besides this specific appropriation, an annual increase should be provided.

The Library has available the income of the Reese Fund of $50,000, which is about $1,630. This sum is hardly sufficient for the purchase of periodicals even, much less for the purchase of new books, which are constantly required in order that the students of the University may be provided with materials for their regular work.

The regular expenses of the Library at present for salaries are:

Salary of the Librarian	$1,800 00
Salary of one Assistant Librarian	600 00
Salary of Janitor for the Library Building	360 00

This Janitor is, in fact, an assistant, and is chosen from among the students. A second assistant, whose whole time can be devoted to the Library, is really required, in order to make the Library fully useful. His salary should be $600.

To keep the Library in full working order, a regular annual appropriation of $8,245 is required, to be expended as given in the estimate below.

Estimates of annual expenses to meet absolute wants:

Library Assistant	$600 00
For currently received periodicals, transactions, annually	1,500 00
For purchase of bound books, monographs, etc., annually*	5,000 00
For binding of periodicals, purchases, and gifts received unbound	800 00
For supplies, stationery, annually	60 00
For expressage, freight, (about) annually	250 00
For postage, annually	35 00
Total annual increase	$8,245 00

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[*] As the staff of instruction and number of students increase our wants will increase in considerably more than in arithmetical proportion.

LECTURES TO BE GIVEN BY NON-RESIDENT PROFESSORS.

It is of the highest importance that a series of lectures should be given by distinguished persons on special subjects in which they are eminent authorities. These persons should be invited from the Eastern States as well as from California. In order to secure their services it will be necessary to pay the usual price for lectures, namely, $50 per lecture. It will be further necessary that each course should consist of several lectures—say four. Hence each lecturer's services, on the average, will cost $200. If ten courses of lectures can be given during the year on such subjects as cannot be regularly taught in the University, owing to lack of funds, a sum of $2,000 annually would be required. To this must be added the cost of travel to and from California. This can hardly be less than $1,500. An appropriation of $3,500 annually is required to carry this out, and it should be given.

THE COLLEGE CAMPUS.

It is a matter of considerable importance that the College campus should be put in good condition. It is now some sixteen feet higher at one end than at the other; consequently it is unfitted for playing athletic games, on account of the advantage to the side holding the higher ground. Practically the students seldom use it except for exercise before their real games.

The games themselves are played at grounds at Oakland and elsewhere; that is, not under the College authorities, and not under their discipline.

It is desirable that this campus should be put in proper condition, and that the students should be forbidden to play on any other grounds than ours; that they should be permitted to invite any other clubs that they please, and be held responsible for the entire good order of their own games, and for the conduct of their visitors.

It is only in this way that the University authorities can have proper control over the games of the students, and that the students can be made entirely responsible to the authorities for good order and gentlemanly behavior.

A specific appropriation of $4,000 is asked for for this purpose.

REFURNISHING OF THE UNIVERSITY BUILDINGS.

In order to carry on the work of the University properly, some important additions should be made to the very insufficient furnishing of the lecture rooms, etc. For this purpose there will be required:

In North Hall	$1,000 00
In the Mechanics' Building	250 00
In the Mining Building	250 00
In the Library	300 00
In South Hall	500 00
In the Gymnasium	250 00
In the Viticultural Museum and Laboratory	500 00
Total	$3,050 00

FUEL AND GAS.

The average cost of fuel in the University buildings is about $500 per year. The average cost of gas in the University buildings is about $300 per year. These items are now sufficiently provided for, and no increase is asked for.

REPAIRS.

The average annual expense of keeping the buildings in a proper state of repair will be about as follows:

North Hall	$300 00
Mechanics' Building	300 00
Library Building	150 00
South Hall	300 00
Viticultural Laboratory	250 00
Observatory	150 00
Cottages	700 00
Other buildings	200 00
Care of the grounds	6,000 00
Fences	300 00
Water supply	500 00
Total	$9,150 00

UNIVERSITY MECHANICS.

During the past year the University has employed a carpenter at a salary of seventy-five dollars per month in a carpenter shop fitted up for the purpose. He has more than saved his salary by repairs made upon the various buildings, and by overseeing small work which was done by contract. It is obvious that so much State property can be most economically cared for by employing two or three workmen permanently as—a carpenter, a painter, and a plumber. These workmen will have their entire time taken up by the mere care of the University property, and by making such small additions as are in their power. Any large work must be done by contract. Small matters can be most economically attended to in this way.

An appropriation of $1,800 per year ought to be given to pay for the services of a painter and of a plumber.

JANITORS.

At present the University employs Janitors as follows: one for North Hall; one for South Hall; one for the Gymnasium and Observatory; one for the Mechanics and Mining Building; one policeman on the grounds—that is, five in all.

These employés cannot do the work which is required of them, and the lack is made up by employing students. The money thus spent could be better used in another way.

There should be the following Janitors: One for North Hall; one for South Hall; one for the Library Building; one for the Viticultural Laboratory and Observatory; one for the Gymnasium, besides the policeman as above—that is six in all. The increased appropriation asked for is therefore $600.

RECAPITULATION.

Department.	Specific Appropriations required.	Increase of Annual Income required.
President's office		$1,200 00
Greek	$181 72	750 00
Mining and metallurgy	5,000 00	1,800 00
English	1,000 00	1,500 00
Mechanical engineering	11,211 00	300 00
Agriculture and viticulture		5,150 00
Intellectual and moral philosophy		
Military science		
Instructor in gymnastics		1,200 00
New armory	1,000 00	
Repairs to gymnasium		300 00
Mineralogy, economic geology, museums	7,850 00	2,600 00
Latin		750 00
Physics		1,650 00
Biology	5,000 00	5,400 00
Geology and comparative physiology		500 00
Museums		1,300 00
History and political economy		
French and Spanish		1,800 00
German		1,500 00
Chemistry		2,900 00
New chemical laboratory		
Civil engineering and astronomy		1,900 00
Mathematics (for collection of models)	1,000 00	
Oriental languages		
Drawing (beside collection of models. See above)		1,500 00
Botany		3,200 00
Library (half of what is needed)	11,650 00	
Library (annual expenses)		8,245 00
Lectures by non-residents		3,500 00
College campus	4,000 00	
Furniture of lecture rooms	3,050 00	
Fuel and gas		
Repairs to University buildings		9,150 00
University mechanics		1,800 00
Janitors		600 00
Totals	$50,942 72	$60,495 00

MEANS OF OBTAINING THE INCREASED INCOME NECESSARY.

It has been impossible for me to command the time in which to compile a table which should show the *sources* from which the various Land-grant Colleges of the United States obtain their incomes. It may suffice to quote three typical cases, as follows:

The Ohio State University has deposited the proceeds of its land-grant ($535,000) with the State Treasurer, and upon this deposit the State pays an interest of six per cent ($32,100). Regular annual appropriations of about $20,000 are also made.

The *Michigan State University* receives, as the proceeds of its land grant, about $45,000 yearly. It receives from *fees from its students* about $60,000 yearly. The State of Michigan makes annual appropriations also; but the most important State aid is given in the form of a tax of $\frac{1}{20}$ of one mill on every dollar of the assessed valuation of the State. This is the same as $\frac{1}{20}$ of one dime on every $100. This tax produces about $43,000 at present, and increases with the growing wealth of the State. In California, where the assessed valuation is about $718,444,000, such a tax would produce $35,922.

The *Wisconsin State University* is also chiefly supported by a proportional tax levy of $\frac{1}{8}$ of one dime on the $100 of assessed valuation. Such a tax, if levied in California, would produce $89,805 yearly.

Analogous methods are followed in various western and northwestern States.

The great advantage of the proportional tax system is that it produces an income which is proportional to the value of the State's wealth, and thus keeps the University income abreast with the wants of the State without perpetual adjustments and readjustments, which are annoying to the Legislature and demoralizing to the college, and an entirely unnecessary waste of valuable time.

When the ratio of $\frac{1}{20}$, $\frac{1}{10}$, or $\frac{1}{8}$ of a dime on the $100 is once *properly* fixed, no further legislative action is necessary. Legislative *supervision*, to insure the proper disbursement of this public money, is always a public duty.

The proper ratio, $\frac{1}{20}$, $\frac{1}{10}$, or $\frac{1}{8}$ must be fixed in each State separately. In a general way, it may be said that where State Universities do not furnish *free* tuition, as they do not in Michigan, for example, the fees from students will form so important a part of the income, that the proportional tax may be set at $\frac{1}{20}$ of a dime on the $100.

In cases like the University of Wisconsin, and the University of California, where the tuition is *absolutely free to all*, the proper ratio seems to have been fixed by experience at about $\frac{1}{10}$ of a dime (*i. e.*, 1 cent) on the hundred dollars. This was the ratio in Wisconsin up to 1883. The University of Wisconsin has very little accumulated capital, and in 1883 it was found necessary to raise this ratio to $\frac{1}{8}$. The University of California has always been most liberally treated by the various State Legislatures, and also by private donors, and fortunately possesses a respectable accumulated capital. In this case the ratio of $\frac{1}{10}$, or 1 cent on the $100, would be ample, and at present even more than is required. This ratio would produce, at present, $71,844. The preceding careful estimates have shown that $60,000 would provide for our wants in the liberal way in which they should be provided for in a great State like California.

I therefore suggest the passage of the following Act:

An Act to provide for the permanent support of the State University.

Section 1. There is hereby appropriated for each fiscal year hereafter out of the General Fund of the State Treasury, the sum of sixty thousand dollars, exclusive of all other appropriations for this purpose, for the permanent support of the University of California.

Sec. 2. The Controller of the State, on the first of January in the thirty-ninth fiscal year, and in each succeeding fiscal year thereafter, must draw his warrant for said sum in favor of the Treasurer of the Board of Regents of said University, payable out of the General Fund.

Respectfully submitted.

EDWARD S. HOLDEN, President.

Report of the Dean of the Colleges of Letters, Agriculture, Mechanics, Mining, Civil Engineering, and Chemistry.

To Edward S. Holden, *President of the University of California:*

Sir: I have the honor to submit herewith the following report on the administration of instruction in the Colleges of Letters, Agriculture, Mechanics, Mining, Civil Engineering, and Chemistry, for the academic year 1885–86:

ATTENDANCE.

There were enrolled in these six colleges, during the entire year, a total of two hundred and forty-nine students, of which two hundred and six were young men, and forty-three young women. Of the latter, six, and of the former, thirty-four, withdrew before the close of the year, leaving one hundred and seventy-two young men and thirty-seven young women, a total of two hundred and nine, who remained in college throughout the year. Of those who withdrew, two received honorable dismissal, one dismissal without censure, one was stricken from the roll, seven were given indefinite leave of absence, eleven leave of absence till September, 1886, two leave of absence till February, 1887, and sixteen withdrew without giving notice of their intentions. Two extensions of leave of absence till September, 1886, were granted to students not at present on our roll, and one candidate for entrance was admitted to full standing at the beginning of the second term, but not being able, for financial reasons, to join his class, was given leave of absence for a year.

The reasons assigned by students for the necessity of intermitting college work, were in eight cases illness, in four illness of friends, in seven business. One hundred and ninety-eight excuses for temporary absence from college exercises were granted during the second term by the Dean.

ENROLLMENT BY CLASSES.

The following table exhibits in detail the numbers of persons enrolled, during each term, in the various classes into which the students are grouped:

ATTENDANCE IN THE SEVERAL CLASSES.

First Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	9	13	30	40	63	11	9	26	201
	Young women	2	4	5	4	6	0	4	17	42
	Totals	11	17	35	44	69	11	13	43	243
Withdrew by leave	Young men	----	----	1	----	7	1	----	1	10
	Young women	----	----	0	----	0	0	----	0	0
	Totals	----	----	1	----	7	1	----	1	10
Withdrew without giving notice	Young men	1	1	----	1	3	----	2	2	10
	Young women	0	0	----	0	0	----	0	1	1
	Totals	1	1	----	1	3	----	2	3	11

Second Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	10	12	29	39	53	10	10	24	*187
	Young women	2	4	5	4	6	0	4	17	†42
	Totals	12	16	34	43	59	10	14	41	229
Withdrew by leave	Young men	1	----	----	2	5	3	----	1	12
	Young women	0	----	----	0	0	0	----	2	2
	Totals	1	----	----	2	5	3	----	3	14
Withdrew without giving notice	Young men	0	----	----	----	----	----	1	1	2
	Young women	2	----	----	----	----	----	0	1	3
	Totals	2	----	----	----	----	----	1	2	5

* Five admitted Second Term. † One admitted Second Term.

These figures vary in detail considerably, but, in the aggregate, only slightly from the corresponding statistics of the preceding year, given in the University Register for 1884–5, as the following comparative table shows. The enrollment for the entire year is given in each case:

		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance in 1884–5	Young men	5	18	15	35	61	16	10	37	197
	Young women	0	7	3	4	8	0	0	21	44
	Totals	5	25	18	39	69	16	10	58	241
In attendance in 1885–6	Young men	11	13	30	40	63	11	12	27	207
	Young women	2	4	5	4	6	0	4	18	43
	Totals	13	17	35	44	69	11	16	45	250

The falling off of students in Limited Courses seems to indicate that the enforcement (for the first time last year) of the examination requirements for entrance to such courses has relieved the pressure, formerly brought to bear by applicants, to get into the University through that channel, without going through the disagreeable ordeal of examination.

It will be observed that in each instance the three lower classes that were promoted lost a portion of their membership, in passing on to the higher classes of the next year, but the diminution was marked only in the case of the Freshman-Sophomore class, which, with a membership of sixty-nine in 1884–5, had as a Sophomore class in 1885–6, a membership of only forty-four. The numbers of young women in attendance have remained very nearly stationary during the past two years.

ENROLLMENT BY COLLEGES.

The enrollment, classified by Colleges, is exhibited in the following tables:

IN THE COLLEGE OF LETTERS.

Classical Course.

First Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	3	4	7	14	11	1	----	2	42
	Young women	0	1	1	0	0	0	----	2	4
	Totals	3	5	8	14	11	1	----	4	46
Withdrew by leave	Young men	----	----	1	----	1	*1	----	----	3
	Young women	----	----	0	----	0	0	----	----	0
	Totals	----	----	1	----	1	1	----	----	3
Withdrew without giving notice	Young men	----	----	----	1	----	----	----	----	1
	Young women	----	----	----	0	----	----	----	----	0
	Totals	----	----	----	1	----	----	----	----	1

Second Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	3	4	6	13	10	----	----	2	38
	Young women	0	1	1	0	0	----	----	2	4
	Totals	3	5	7	13	10	----	----	4	42
Withdrew by leave	Young men	----	----	----	----	----	----	----	----	----
	Young women	----	----	----	---	----	----	----	----	----
	Totals	----	----	----	----	----	----	----	----	----
Withdrew without giving notice	Young men	----	----	----	----	----	----	----	0	0
	Young women	----	----	----	----	----	----	----	1	1
	Totals	----	----	----	----	----	----	----	1	1

* Stricken from the roll eleventh of December, 1885.

Literary Course.

FIRST TERM.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	1	1	4	2	7	1	0	6	22
	Young women	2	1	0	2	2	0	4	12	23
	Totals	3	2	4	4	9	1	4	18	45
Withdrew by leave	Young men	----	----	----	----	2	----	----	----	2
	Young women	----	----	----	----	0	----	----	----	0
	Totals	----	----	----	----	2	----	----	----	2
Withdrew without giving notice	Young men	----	----	----	----	1	----	----	1	2
	Young women	----	----	----	----	0	----	----	1	1
	Totals	----	----	----	----	1	----	----	2	3

SECOND TERM.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	1	1	4	2	4	1	0	5	18
	Young women	2	1	0	2	2	0	4	11	22
	Totals	3	2	4	4	6	1	4	16	40
Withdrew by leave	Young men	----	----	----	----	----	----	----	0	0
	Young women	----	----	----	----	----	----	----	1	1
	Totals	----	----	----	----	----	----	----	1	1
Withdrew without giving notice	Young men	0	----	----	----	----	----	----	----	0
	Young women	2	----	----	----	----	----	----	----	2
	Totals	2	----	----	----	----	----	----	----	2

Course in Letters and Political Science.

First Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	----	4	5	14	21	3	----	3	50
	Young women	----	2	4	2	3	0	----	2	13
	Totals	----	6	9	16	24	3	----	5	63
Withdrew by leave	Young men	----	----	----	----	1	----	----	----	1
	Young women	----	----	----	----	0	----	----	----	0
	Totals	----	----	----	----	1	----	----	----	1
Withdrew without giving notice	Young men	----	1	----	----	2	----	----	----	3
	Young women	----	0	----	----	0	----	----	----	0
	Totals	----	1	----	----	2	----	----	----	3

Second Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	----	3	5	14	18	3	----	3	47
	Young women	----	2	4	2	3	0	----	*3	13
	Totals	----	5	9	16	21	3	----	6	60
Withdrew by leave	Young men	----	----	----	1	3	2	----	0	6
	Young women	----	----	----	0	0	0	----	1	1
	Totals	----	----	----	1	3	2	----	1	7
Withdrew without giving notice	Young men	----	----	----	----	----	----	----	1	1
	Young women	----	----	----	----	----	----	----	0	0
	Totals	----	----	----	----	----	----	----	1	1

* One admitted tenth of February, 1886.

IN THE COLLEGE OF AGRICULTURE.

First Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	----	1	1	----	2	----	----	----	4
	Young women	----	0	0	----	0	----	----	----	0
	Totals	----	1	1	----	2	----	----	----	4

Second Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	1	1	1	----	2	----	2	----	*7
	Young women	0	0	0	----	0	----	0	----	0
	Totals	1	1	1	----	2	----	2	----	7

* Three admitted in April and May, 1886. None withdrew from this College during the year.

IN THE COLLEGE OF MECHANICS.

First Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	2	----	2	4	1	----	3	2	14
	Young women	0	----	0	0	0	----	0	0	0
	Totals	2	----	2	4	1	----	3	2	14

Second Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	2	----	2	4	1	----	3	2	*14
	Young women	0	----	0	0	0	----	0	0	0
	Totals	2	----	2	4	1	----	3	2	14

* None withdrew from this College during the year.

IN THE COLLEGE OF MINING.

FIRST TERM.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	----	3	3	2	6	2	3	3	22
	Young women	----	0	0	0	0	0	0	0	0
	Totals	----	3	3	2	6	2	3	3	22
Withdrew by leave	Young men	----	----	----	----	2	----	----	----	2
	Young women	----	----	----	----	0	----	----	----	0
	Totals	----	----	----	----	2	----	----	----	2
Withdrew without giving notice	Young men	----	----	----	----	----	----	2	----	2
	Young women	---	----	----	----	----	----	0	----	0
	Totals	---	----	----	----	----	----	2	----	2

SECOND TERM.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	*1	3	3	2	4	2	1	3	19
	Young women	0	0	0	0	0	0	0	0	0
	Totals	1	3	3	2	4	2	1	3	19
Withdrew by leave	Young men	1	----	----	1	----	1	----	1	4
	Young women	0	----	----	0	----	0	----	0	0
	Totals	1	----	----	1	----	1	----	1	4

* Admitted tenth of February, 1886.

IN THE COLLEGE OF CIVIL ENGINEERING.

First Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	1	----	7	3	10	1	----	5	27
	Young women	0	----	0	0	0	0	----	1	1
	Totals	1	----	7	3	10	1	----	6	28
Withdrew by leave	Young men	----	----	----	----	----	----	----	1	1
	Young women	----	----	----	----	----	----	----	0	0
	Totals	----	----	----	----	----	----	----	1	1

Second Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	1	----	7	3	10	1	*1	4	27
	Young women	0	----	0	0	0	0	0	1	1
	Totals	1	----	7	3	10	1	1	5	†28

* Admitted tenth of February, 1886.

† None withdrew during the Second Term.

IN THE COLLEGE OF CHEMISTRY.

First Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	2	----	1	1	5	3	3	5	20
	Young women	0	----	0	0	1	0	0	0	1
	Totals	2	----	1	1	6	3	3	5	21
Withdrew by leave	Young men	----	----	----	----	1	----	----	----	1
	Young women	----	----	----	----	0	----	----	----	0
	Totals	----	----	----	----	1	----	----	----	1
Withdrew without giving notice	Young men	1	----	----	----	----	----	----	1	2
	Young women	0	----	----	----	----	----	----	0	0
	Totals	1	----	----	----	----	----	----	1	2

Second Term.		Graduates	Seniors	Juniors	Sophomores	Freshmen	At Large	Special	Limited	Totals
In attendance	Young men	1	----	1	1	4	3	3	4	17
	Young women	0	----	0	0	1	0	0	0	1
	Totals	1	----	1	1	5	3	3	4	18
Withdrew by leave	Young men	----	----	----	----	2	----	----	----	2
	Young women	----	----	----	----	0	----	----	----	0
	Totals	----	----	----	----	2	----	----	----	2
Withdrew without giving notice	Young men	----	----	----	----	----	----	1	----	1
	Young women	----	----	----	----	----	----	0	----	0
	Totals	----	----	----	----	----	----	1	----	1

RECAPITULATION.

First Term.		Classical Course	Literary Course	Course in Let. and Pol. Sci.	College of Agriculture	College of Mechanics	College of Mining	College of Civil Eng.	College of Chemistry	Totals
In attendance	Young men	42	22	50	4	14	22	27	20	201
	Young women	4	23	13	0	0	0	1	1	42
	Totals	46	45	63	4	14	22	28	21	243
Withdrew by leave	Young men	3	2	1	----	----	2	1	1	10
	Young women	0	0	0	----	----	0	0	0	0
	Totals	3	2	1	----	----	2	1	1	10
Withdrew without giving notice	Young men	1	2	3	----	----	2	----	2	10
	Young women	0	1	0	----	----	0	----	0	1
	Totals	1	3	3	----	----	2	----	2	11

Second Term.		Classical Course	Literary Course	Course in Let. and Pol. Sci.	College of Agriculture	College of Mechanics	College of Mining	College of Civil Eng.	College of Chemistry	Totals
In attendance	Young men	38	18	47	7	14	19	27	17	187
	Young women	4	22	14	0	0	0	1	1	42
	Totals	42	40	61	7	14	19	28	18	229
Withdrew by leave	Young men	----	0	6	----	----	4	----	2	12
	Young women	----	1	1	----	----	0	----	0	2
	Totals	----	1	7	----	----	4	----	2	14
Withdrew without giving notice	Young men	0	0	1	----	----	----	----	1	2
	Young women	1	2	0	----	----	----	---	0	3
	Totals	1	2	1	----	----	----	----	1	5

A comparison of this summary with the corresponding one for the previous year, gives the following result. The numbers include the entire enrollment for each year:

		Classical Course	Literary Course	Course in Let. and Pol. Sci.	College of Agriculture	College of Mechanics	College of Mining	College of Civ. Eng.	College of Chemistry	Totals
In attendance in 1884–5	Young men	45	26	38	8	10	20	29	21	197
	Young women	6	26	10	0	0	0	1	1	44
	Totals	51	52	48	8	10	20	30	22	241
In attendance in 1885–6	Young men	42	22	51	7	14	23	28	20	207
	Young women	4	23	14	0	0	0	1	1	43
	Totals	46	45	65	7	14	23	29	21	250

The marked increase of attendance in the Course in Letters and Political Science (a course now in its fourth year), and the corresponding decrease of that in the Classical and the Literary Courses, is probably attributable to two principal causes: (1) It is popularly believed to offer a more direct preparation for immediate success in a variety of pursuits in life; (2) Students can enter it either with or without Latin or Greek, or both, and this course can therefore bid for students not eligible to the other two.

DEPORTMENT.

The friendly relations between professors and students have been undisturbed by any noticeable clashing of college regulations with student interests, and the general deportment of students has been so excellent as to cause no case of discipline for ungentlemanly conduct to come before any of the faculties.

Several cases of neglect of work have been reported to the Dean, and correspondence with parents has been resorted to in two instances. But no students were remanded to lower classes, although it is strongly probable that two or three removals of this sort would have been necessary but for the withdrawal from the University of the students concerned; and two or three other cases will require early attention.

THE COURSES OF INSTRUCTION.

There were offered to students, for the academic year 1885–6, a total of one hundred and twenty-two different courses of study, ninety-four of which were actually given by lecture, recitation, laboratory experiment, and field-work. The following table details a concise account of these courses and the attendance in each:

RECORD OF SUBJECTS TAUGHT AND OF ATTENDANCE IN EACH CLASS PURSUING THEM.

NOTE.—In the last three columns the upper figures on the left refer to young men, the lower to young women; the numbers on right side of column include both, = sum of the other two.

INSTRUCTOR.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			PHILOSOPHY.						
			UNDERGRADUATE COURSES.						
Professor Howison	1	I	PROPÆDEUTIC TO PHILOSOPHY. The Logic underlying Grammar; Familiarization of the Common Categories by their use in the Analysis of Propositions and Terms.	Lectures. No text-book used	1	1	23 10, 33	21 7, 28	19 7, 26
Professor Howison	2	II	INTRODUCTION TO PHILOSOPHY. Empirical Psychology, including Formal Logic, deductive and inductive; General History of Philosophy.	Janes's Psychology; Fowler's Deductive Logic; Fowler's Inductive Logic; Schwegler's History of Philosophy	3	3	13 7, 20	9 4, 13	6 3, 9
Professor Howison	3	III	ELEMENTARY ETHICS, HISTORICALLY TREATED. Including a critique of Perfectionism and Hedonism, of Necessity and Freedom, and of Optimism and Pessimism.	Lectures. No text-book used	2	------	------ 10	5 2, 7	5 2, 7
Professor Howison	4	IV	ELEMENTS OF CIVIL POLITY. The Nature of a State and its Bearing on the Limits of Allegiance and Liberty; including a brief sketch of the History of Political Theories.	Mulford's The Nation	------	2	6 3, 9	6 2, 8	6 2, 8
Professor Howison	5	V	DESCARTES AND SPINOZA. Dualism and Monism.	Veith's Descartes; White's translation of Spinoza's Ethic; Martineau's Study of Spinoza	2	------	------ 4	0 1, 1	0 1, 1
Professor Howison	6	VI	SPINOZA AND LEIBNITZ. Pantheism and Monadism, or Universalism and Individualism.	White's translation of Spinoza's Ethic; Martineau's Spinoza	------	2	2 2, 4	0 1, 1	0 1, 1
			GRADUATE COURSES.						
Professor Howison	7	XXIII	KANT. The *Kritik der reinen Vernunft*, in Hartenstein's edition.	Kant's *Kritik der reinen Vernunft* and Max Müller's translation of the same	3	3	2 0, 2	* *	------ ------

* Graduate courses are not followed by examinations *seriatim*. Examinations are prescribed to only such graduate students as are candidates for higher degrees, and then only after the entire work of preparation for such degrees has been completed.

Record of Subjects Taught and of Attendance in each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			HISTORY AND POLITICAL ECONOMY.						
Mr. W. C. Jones	8	II	European History. The history of Continental Europe from 1453 to 1871.	Dyer's Modern Europe	4	4	47 14, 61	43 10, 53	37 10, 47
Mr. W. C. Jones	9	III	United States History. (*a*) The social, political, and constitutional history of the Colonies.	Bancroft's History of the United States		4	18 2, 20	16 2, 18	16 2, 18
	10		(*b*) Constitutional Law: The Articles of Confederation; history of the formation of the Constitution; systematic consideration of its provisions and of the principles of Constitutional Law.	Frothingham's Rise of the Republic; Curtis' History of the Constitution, vol. I, pp. 379; Cooley's Principles of Constitutional Law; Cooley's Constitutional Limitations	4		13 5, 18	11 5, 16	11 5, 16
Mr. W. C. Jones	11	IV	Roman Law; Jurisprudence. History of the public and private law of the Romans; systematic study of Roman Law, with comparative views of the chief modern systems; the science of Positive Law.	Morey's Roman Law; Holland's Jurisprudence; Markby's Elements of Law; Maine's Ancient Law	2	2	6 1, 7	6 1, 7	6 1, 7
Professor Moses	12	VI	Political Economy. A general view of the principles and laws of Political Economy in its present position.	Walker's Political Economy; Mill's Principles of Political Economy		4	22 8, 30	23 7, 30	23 7, 30
Professor Moses	13	VII	Advanced Political Economy. A critical study of the history of economic thought.	Adam Smith's Wealth of Nations; Rae's Contemporary Socialism; Bastiat's Harmonies of Political Economy	4		5 1, 6	5 1, 6	5 1, 6
Professor Moses	14	VIII	Comparative Constitutional History. A comparative view of the development and present condition of the political institutions of the Western nations.	Crane & Moses' Politics; Cox's The Institutions of the British Government	4		11 3, 14	10 3, 13	10 3, 13
Professor Moses	15	IX	History of Political Theories. The history of political thought and its practical influence on institutions.	Aristotle's Politics; Machiavelli's The Prince; Hobbes' Leviathan; Locke's Civil Government; Montesquieu's The Spirit of Laws		4	8 3, 11	7 3, 10	7 3, 10
			PHILOLOGY.						
Professor Kellogg	16	I	Linguistics.	Whitney's Language and the Study of Language	2		2 0, 2	2 0, 2	2 0, 2
Professor Kellogg	17	II	Comparative Philology.	Lectures. References to Peiles' Introduction to Greek and Latin Etymology; Papillon's Comparative Philology of Greek and Latin; Halsey's Latin and Greek Etymology		2	2 0, 2	2 0, 2	2 0, 2

Record of Subjects Taught and of Attendance in Each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			GREEK.						
Mr. Deamer	18	I	Selections from Greek Authors.	Boise and Freeman's selections from Greek Authors, containing portions of Homer's Odyssey, Herodotus, Thucydides, Xenophon's Memorabilia, Plato's Phædo, Arrian and Lucian; Demosthenes' Third Olynthiac; sight reading in the Iliad	4	4	12 1, 13	11 0, 11	10 0, 10
Professor Bunnell	19	II	Plato, Æschylus, Euripides, Sophocles.	Plato's Apology and Crito, Æschylus' Prometheus, Euripides' Alcestis, Sophocles' Antigone, Euripides' Medea at sight	4	4	14 0, 14	13 0, 13	13 0, 13
Professor Bunnell	20	III	Sophocles, Plato, Lysias, Demosthenes.	Sophocles' Oedipus Tyrannus, Plato's Gorgias, Lysias' Select Orations, three Philippics of Demosthenes at sight, Lectures on Greek Archæology	2	3	6 2, 8	2 2, 4	2 2, 4
Professor Bunnell	21	IV	Demosthenes, Æschines, Aristophanes.	Demosthenes' Oration on the Crown; Æschines' Oration against Ctesiphon, Aristophanes' Frogs, Clouds, or Birds; Sophocles' Œdipus Tyrannus at sight	3	2	4 1, 5	2 1, 3	2 1, 3
			LATIN.						
Mr. Deamer	22	I	Livy, Sallust, Horace.	Two books of Livy, Sallust's Catiline, the Odes of Horace; Latin composition	4	5	23 5, 28	17 4, 21	16 4, 20
Mr. Deamer	23	II	Terence, Plautus, Horace, Tacitus.	Two plays of Terence, one play of Plautus, Satires and Epistles of Horace, Germania and Agricola of Tacitus	3	3	21 2, 23	19 2, 21	17 1, 18
Professor Kellogg	24	III	Cicero, Quintilian, Juvenal, Elegiac Poets.	Cicero and Quintilian in Kellogg's Ars Oratoria, Cicero's Brutus, Satires of Juvenal	5	2	12 1, 13	3 1, 4	3 1, 4
Professor Kellogg	25	IV	Cicero, Vergil. (1) First Term:	Cicero's Tusculan Disputations	2	------	4 5, 9	4 2, 6	4 2, 6
			(2) Second Term:	Books VII–XII of Vergil's Æneid	------	5	2 0, 2	1 0, 1	1 0, 1
Professor Kellogg	26	V	Roman Archæology.	Wilkins' Roman Antiquities; and lectures by the Professor in charge	------	1	14 0, 14	14 0, 14	14 0, 14

Record of Subjects Taught, and of Attendance in Each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			ENGLISH.						
Mr. Bradley	27	I	English Prose Style. Study of English prose composition.	Minto's Manual of English Prose Literature; John Wilson's Prose Style (Miss McLean); Lewes' Elements of Success in Literature; De Quincey's Confessions of an English Opium Eater; Macaulay's Select Essays; Carlyle's Past and Present; Scott's Kenilworth; Ruskin's Sesame and Lilies; Wilson's Noctes Ambrosianæ; Burke's Works (Vol. I, edited by Payne)	4	4	71 14, 85	55 10, 65	48 9, 57
Mr. Bradley	28	II	Preparation of Summaries. Exercises in abstracting and tabulating.	The Précis Book	1		24 2, 26	22 2, 24	18, 20 2
Professor Cook	29	III	History of English Literature. A rapid survey of the whole field, followed by the study of representative authors in chronological order.	Stopford Brooke's Literature Primer; Tyler's Morley's English Literature; Chambers' Cyclopœdia of English Literature; a large number of periodical essays	3		31 8, 39	30 9, 39	30 9, 39
Professor Cook	30	IV	English Classics. A course in *Belles Lettres*, based upon selections from eminent poets and prose writers.	Shelley, Keats, Wordsworth, and several other poets. Constant use of library		3	30 10, 40	27 9, 36	27 9, 36
Professor Cook	31	V	Shakespeare. Critical study of one or more plays.	King Lear studied, and many of the plays read; Dowden's Shakespeare Primer; Abbott's Shakespearian Grammar; Schmidt's Shakespeare Lexicon	3		7 2, 9	7 2, 9	7 2, 9
Professor Cook	32	VI	Old English. Reading of simple prose; elements of Old English grammer as an introduction to the historical study of English.	This subject having already been pursued by the class, in consequence of a different previous arrangement, a course of Rhetoric was substituted, on the basis of Quintilian among the ancients, and De Mille among the moderns		3	8 2, 10	8 2, 10	8 2, 10
Professor Cook	33	VII	Chaucer and Middle English. Critical study of selected works of Chaucer; survey of Middle English Literature; studies in phonology and syntax; dialectical variations; development of the language from the Old English period.	Chaucer's Poems; Ten Brink's Language and Prosody of Chaucer	3		3 1, 4	3 1, 4	3 1, 4
Professor Cook	34	IX	Advanced Old English; Beowulf. Critical study of Beowulf; survey of Old English literature; lectures on Old English Grammar.	Harrison and Sharp's Beowulf; Wuelcker's History of Old English Literature		3	3 1, 4	3 1, 4	3 1, 4

Record of Subjects Taught, and of Attendance in Each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
				1st Term	2d Term		In Attendance	Passed
Mr. Bradley	35	X	THEMES. *Freshman Year*—Four themes each term are required in all courses			67 12, 79		
			Sophmore Year—Four themes each term are required in the Classical and Literary courses and the course in Letters and Political Science; three themes each term are required in all the Scientific courses			40 9, 49		
Professor Cook	36	X	THEMES. *Junior Year*—Two themes each term are required in all courses			33 6, 39		
			Senior Year—Two themes each term are required in the Classical and Literary courses and the course in Letters and Political Science			9 3, 12		

RECORD OF SUBJECTS TAUGHT, AND OF ATTENDANCE IN EACH CLASS PURSUING THEM—Continued.

INSTRUCTOR.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			GERMAN.						
Professor Putzker	37	I	INTRODUCTORY COURSE. First year: Grammar and translation, with lectures on the topics under consideration. Written exercises and conversational practice throughout the course.	Comfort's German Course; Boisen's Preparatory Book of German Prose; Whitney's Dictionary	4	4	46 15, 61	37 14, 51	35 13, 48
Professor Putzker	38	I	INTRODUCTORY COURSE. Second year: Continuation of the preceding.	Comfort's German Course; Comfort's German Reader; Schiller's Maria Stuart, and Jungfrau von Orleans in the Cotta'sche Bibliothek der Weltliteratur	4	4	33 10, 43	26 10, 36	25 10, 35
Professor Putzker	39	II	GŒTHE AND SCHILLER. Translation of selected masterpieces.	Gœthe's Götz von Berlichingen, Clavigo, and Egmont; Schiller's Piccolomini, Wallenstein's Tod, Wilhelm Tell, and Jungfrau von Orleans	3	3	14 5, 19	12 5, 17	11 5, 16
Professor Putzker	40	III	LESSING AND GŒTHE. Translation of selected masterpieces.	Lessing's Nathan der Weise, Emilia Galotti, and Minna von Barnhelm; selections from Gœthe's works assigned to individual students	2	2	3 2, 5	2 2, 4	2 2, 4
			FRENCH.						
Mr. H. B. Jones	41	I	INTRODUCTORY COURSE. First year: (1) History of the formation of the French language; students' comparative grammar; parts of speech, irregular verbs; translating French exercises into English, with special reference to idioms; syntax; written exercises from English into French; reading and translating La Bataille de Dames.		4	4	21 4, 25	14 0, 14	14 0, 14
Mr. H. B. Jones	42	I	INTRODUCTORY COURSE. Second year: (2) Reading and translating: L'Avare, preceded by a biography of the author, and an exposition of his object in writing the play; difference of the language of his day from that of the present time discussed.	Les Précieuses Ridicules, Phèdre; Esther; La Tulipe noire, by A. Dumas; translations from Longfellow's Outre-Mer	3	3	7 2, 9	10 2, 12	10 2, 12
Mr. H. B. Jones	43	II	READING AND TRANSLATION. Translation from English into French.	Le Bourgeois Gentilhomme, Le Misanthrope, Les Femmes Savantes, Le Cid, Iphigénie, Esther, Athalie	3	3	7 0, 7	3 0, 3	3 0, 3
Mr. H. B. Jones	44	III	TEXTES CLASSIQUES DE LA LITTERATURE FRANÇAISE, by Demogeot; translations from Pickwick Papers; articles from La Revue des Deux Mondes assigned to each student, extracts having to be made in French.		2	2	3 0, 3	3 3, 6	3 3, 6

Record of Subjects Taught and of Attendance in each Class Pursuing Them—Continued.

Instructor.	Number	No. of Courses as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week. 1st Term	No. Hours a Week. 2d Term	In Attendance at Recitations	At Final Examinations. In Attendance	At Final Examinations. Passed
			SPANISH.						
Mr. H. B. Jones	45	I	Introductory Course. During the first term, Vingut's Spanish Teacher, including syntax. During the second term, Velasquez's New Spanish Reader, with translations from English into Spanish.		3	3	3 3, 6	0 0, 0	
			MATHEMATICS.						
			Solid and Spherical Geometry, Algebra, Trigonometry, Analytic Geometry. Four times a week for three terms, beginning with the first term of the Freshman year. The distribution of the work was as follows:						
Asst. Prof. Clarke	46	I	(1). *Solid and Spherical Geometry.* Freshman year.	Venable's Geometry	4		44 8, 52	38 10, 48	19 9, 28
Asst. Prof. Clarke	47	I	(2). *Algebra.* Freshman year.	Clarke's Algebra		4	38 9, 47	26 5, 31	13 3, 16
Asst. Profs. Edwards and Clarke	48	I	(3). *Trigonometry and Analytic Geometry.* Sophomore year.	Wells' Trigonometry, Todhunter's Conic Sections, Lectures and Exercises	4		27 7, 34	23 5, 28	17 5, 22
			Algebra, Trigonometry, Geometry, Differential Calculus. The distribution of the work was as follows:						
Asst. Prof. Edwards	49	II	(1). *Algebra.* Theory and discussion of algebraic expressions, and the solution of algebraic equations. Solution of simultaneous equations. Elements of the Theory of Determinants. Discussion of series. First term of Freshman year.	Well's Algebra	3		17 6, 23	33 1, 34	23 0, 23
Asst. Prof. Edwards	50	II	(2). *Trigonometry.* The development of the general formulæ of plane and spherical trigonometry, solution of plane and spherical triangles, the use of logarithmic tables. Second term of Freshman year.	Wells' Trigonometry. Gauss' Five-place Tables		2	17 6, 23	32 2, 34	28 2, 30
Prof. Stringham	51	II	(3). *Geometry and the Differential Calculus.* (*a*). Synthetic Geometry, including a resumé of the fundamental propositions of the Euclidean Geometry of Space and a short course in Modern Projective Geometry. (*b*). Analytic Geometry of the straight line, the circle, and the conic sections, including the discussion of the general equation of the second degree. (*c*). First principles of the Differential Calculus. Freshman year.	Wilson's Solid Geometry and C. Smith's Conic Sections, Lectures	3	3	32 1, 33	27 1, 28	14 0, 14
Prof. Stringham and Asst. Prof. Edwards	52	III	Differential and Integral Calculus. Two hours a week in the theory of the subject with Professor Stringham, and two hours a week of exercises with Assistant Professor Edwards.	Taylor's Differential and Integral Calculus	4	4	13 0, 13	13 0, 13	9 0, 9
Asst. Prof. Clarke	53	VI	Modern Methods in Geometry. After Reye, Cremona, and Poncelet.	Reye's Geometrie der Lage	2	2	2 0, 2	1 0, 1	1 0, 1
Asst. Prof. Edwards	54	VII	Quaternions. An elementary presentation of the principles of the subject, with illustrations of its applications to Geometry and Mechanics. Twice a week through the year.	Hardy's Elements of Quaternions	2	2	1 1, 2	1 1, 2	1 1, 2

Record of Subjects Taught, and of Attendance in each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
Professor Stringham	55	VIII	Differential Equations. Theory and methods of solution of total differential equations.	Boole's Differential Equations with references to Forsyth's Differential Equations.	2	2	2 0, 2	2 0, 2	2 0, 2
Asst. Professor Clarke	56	IX	Differential and Integral Calculus. An elementary course for students in non-scientific courses, and for students in scientific courses who are not required to pursue the full mathematical course.	Lectures. No text-book used	2	2	2 0, 2	0 0, 0	------
Professor Stringham	57	------	Modern Projective Geometry.	Lectures. No text-book used	------	1	2 0, 2	0 0, 0	------
			PHYSICS.						
Professor John Le Conte	58	I	General Physics. Lectures on heat, mechanics of liquids, mechanics of gases, mechanics of capillarity and electricity, illustrated by experiments in all the special branches of these subjects. No text-book used		4	4	32 7, 39	19 0, 19	18 0, 18
Professor John Le Conte	59	I	General Physics: Advanced Course. Experimental lectures on magnetism, electro-dynamics, acoustics, and optics. No text-book used		------	2	5 0, 5	5 0, 5	5 0, 5
Mr. Slate	60	V	Physical Laboratory. Exercises connected with the subject of Chemical Philosophy, as pursued by students of agriculture and chemistry, such as: Vapor density determinations by the methods of Meyer, Dumas, Hoffman; determinations of boiling point, specific heat, heat developed in chemical reactions, specific gravity; galvanic measurements connected with electrolysis. No text-book used		------	3	4 0, 4	3 0, 3	3 0, 3
Mr. Slate	61	VI	Physical Laboratory: Problems. Selected physical problems, involving mathematical and experimental work, such as: Experimental determination of moment of inertia and of the focal length and curvature of lenses; measurements of galvanic resistance, and of electro-motive force and intensity; determination of modulus of elasticity, and of coefficients of expansion by heat. No text-book used		------	3	14 0, 14	14 0, 14	14 0, 14
Mr. Slate	62	VII	Physical Laboratory: Problems. A continuation of course VI, consisting of more advanced problems, involving accurate measurement and more extended knowledge. The scope of this work is varied and extended, according to the capacity of the student and the time at his disposal. No text-book used		6	------	2 0, 2	2 0, 2	2 0, 2

RECORD OF SUBJECTS TAUGHT AND OF ATTENDANCE IN EACH CLASS PURSUING THEM—Continued.

INSTRUCTOR.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			CHEMISTRY.						
Prof. Rising and Mr. O'Neill	63	I	ELEMENTARY CHEMISTRY. Recitations and lectures, fully illustrated by experiments.	Eliot and Storer's Elementary Manual of Chemistry	4	*	27 2, 29	10 0, 10	10 0, 10
Prof. Rising	64	II	EXPERIMENTAL LECTURES ON INORGANIC CHEMISTRY.	Roscoe and Schorlemmer's Manual of Chemistry, read in connection with the lectures	2	2	32 0, 32	12 0, 12	9 0, 9
Prof. Rising	65	III	CHEMICAL PHILOSOPHY. In the first term, recitations supplemented with notes and explanations. In the second term, short courses of lectures on Thermochemistry, Electrolysis, and Spectrum Analysis.	Cooke's Chemical Philosophy	2	2	6 0, 6	3 0, 3	3 0, 3
Prof. Rising	66	IV	LECTURES ON ORGANIC CHEMISTRY. One hour a week of optional work was devoted to the reading and explanation of the works of reference. A supplementary practical course in connection with these lectures was given in the laboratory, embracing the preparation and behavior of many of the substances mentioned in the lectures.	Remsen's Organic Chemistry. References to Richter's Organische Chemie	2	2	4 0, 4	2 0, 2	2 0, 2
Mr. O'Neill and Mr. Dunn	67	V	LABORATORY—QUALITATIVE ANALYSIS. General principles of qualitative analysis, characteristic reactions and tests for bases and acids; analysis of simple and complex salts and mixtures; examination of substances in common use, or of domestic importance, for impurities or adulterations. Special attention to the general relations of the elements and to synthetic preparations.	No text-book used	12	8	36 1, 37	27 1, 28	27 1, 28
Prof. Rising and Mr. Dunn	68	VI	LABORATORY—QUANTITATIVE ANALYSIS. Gravimetric and volumetric analysis of ores, minerals, etc.; practice in the preparation of organic and inorganic compounds; organic analysis; special investigations. Methods of analysis.	Thorpe's and Fresenius' Quantitative Analysis	12	12	15 0, 15	2 0, 2	2 0, 2
Mr. O'Neill	69	VII	PHYSIOLOGICAL CHEMISTRY. A course of lectures, embracing a general consideration of the Organism; relation to external conditions, atmospheric pressure, etc., inorganic and organic constituents of the Organism; chemistry of animal tissues and fluids; physiological functions and processes, digestion, respiration, excretion of foods, nutrition, etc. Laboratory practice in the preparation of physiological products, tests for blood and bile constituents, urine and milk analysis. Works of reference: Gamgee's Chemistry of Animal Functions, Hoppe-Seyler's Physiologische Chemie.	Lectures, with references to Gamgee's Chemistry of Animal Functions, and Hoppe-Seyler's Physiologische Chemie	------	3	5 0, 5	3 0, 3	3 0, 3
Prof. Rising and Mr. O'Neill	70	VIII	BLOWPIPE ANALYSIS—QUALITATIVE. Recitations and laboratory practice.	Landauer's and Cornwall's Blowpipe Analysis	------	4	20 0, 20	13 0, 13	11 0, 11

*Same course repeated.

Record of Subjects Taught and of Attendance in Each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
Professor Rising	71	X	Toxicology.	Lectures. No text-book used	1	1	5 0, 5	0 0, 0	------
Professor Rising	72	XI	A Discussion of Modern Theories in Chemistry. First Term: Muir and Lothar Meyer. Second Term: Graham Otto, Vol. I of the Synthetische und Theoretische Chemie.	Muir's. Lothar Meyer's. Vol. I of Graham Otto's Synthetische und Theoretische Chemie, in Horstmann and Lundolt's edition	2	2	2 0, 2	0 0, 0	------
			BOTANY.						
Mr. Greene	73	I	Vegetal Structure and Morphology. Lectures illustrated as fully as possible by living specimens.	Gray's Structural Botany	3	------	8 4, 12	8 3, 11	8 3, 11
Mr. Greene	74	II	Systematic Botany. Practical exercises in the determination of genera and species of California flora.	California Geological Survey (Botany)	------	3	8 3, 11	6 3, 9	6 3, 9
			ZOOLOGY AND GEOLOGY.						
Professor Joseph Le Conte	75	I	Comparative Zoology. Lectures. The course is essentially one of Comparative Physiology. First Term: Organs and functions of animal life, *i. e.*, nervous systems; sense organs; muscular and skeleton system. Second Term: Organs and functions of vegetable life, *i. e.*, digestive, circulatory, respiratory, and excretory systems.	Lectures. References to Huxley's Elementary Physiology, Huxley's Anatomy of Vertebrates, Orton's Comparative Zoology, Packard's Zoology, and Le Conte's Sight	2	2	34 6, 40	28 6, 34	27 6, 33
Professor Joseph Le Conte	76	II	Geology. First Term: Dynamical and structural geology. Second Term: Historical geology.	Lectures. References to Le Conte's Elements of Geology, Geikie's Text-book of Geology, and Dana's Manual of Geology	3	3	24 3, 27	19 3, 22	19 3, 22
			MINERALOGY, PETROGRAPHY, AND ECONOMIC GEOLOGY.						
Mr. Jackson	77	I	Crystallography, Mineralogical Terminology, and Descriptive Mineralogy. *Crystallography* is treated with the view of giving the student sufficient familiarity with the simple and complex forms of each system to enable him to determine natural crystals at sight, or at most with the use of the contact-Goniometer. The *Mineralogical Terminology* deals with all of the physical properties of minerals that are used in determinative work, such as luster, color, streak, optical reactions in polarized light, cleavage, fracture, hardness, etc. The *Descriptive Mineralogy* treats in detail of the crystallographic, physical, chemical, and geological properties of all economically or geologically important minerals.	Lectures. References to Naumann's Elemente der Mineralogie, Dana's Text-book of Mineralogy, Weisbach's Tabeilen zur Bestimmung der Mineralen nach aüsseren Kennzeichen, Weisbach's Synopsis Mineralogica	2	2	18 0, 18	*3 0, 3	3 0, 3

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* Students take the final examination in this course at the end of the second year; after they have finished Course II.

Record of Subjects Taught and of Attendance in each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
Prof. Jackson	78	II	Determination of Minerals by Physical Properties. The determination of unlabeled minerals by means of their physical properties only, the apparatus used consisting of penknife, pocket lens, streak-plate, and magnet, all easily carried in the vest pocket. The object of the course is to give the student sufficient familiarity with the most commonly occurring minerals of economic and geological importance, to enable him to recognize or determine them without delay in the field.	Same works of reference as in the preceding course	4	4	6 0, 6	3 0, 3	3 0, 3
			MECHANICAL DRAWING AND MAPPING.						
Mr. Kower	79	I	Instrumental Drawing and Descriptive Geometry. Drawing of simple patterns and descriptive geometry in its application to perspective, etc.	Lectures and applications in the drawing room. No text-book used	3	3	15 0, 15	15 0, 15	10 0, 10
Mr. Raymond	80	II	Mapping. Topographical, mining, and railroad mapping.	Drawing room exercises. No text-book used	6	6	15 1, 16	13 0, 13	12 0, 12
Mr. Kower	81	III	Mechanical Drawing. Drawing of simple machine parts.	Drawing room exercises. No text-book used	6	6	8 0, 8	8 0, 8	8 0, 8
Mr. Kower	82	IV	Graphostatics. Graphical analysis of stresses in engineering structures.	Lectures and applications in the drawing room. No text-book used	------	2	15 0, 15	15 0, 15	13 0, 13
Mr. Kower	83	V	Construction. The designing of engineering structures and simple machines.	Drawing room exercises. No text-book used	6 to 9	6 to 9	5 0, 5	5 0, 5	5 0, 5
			MECHANICAL ENGINEERING.						
Mr. Slate	84 (a)	I	Analytic Mechanics. The mathematical treatment of the important principles of dynamics and statics, fully illustrated by problems and applications; the course is preliminary to the work in mechanical engineering in the Senior year.	Lectures. No text-book used	4	4	17 1, 18	14 0, 14	10 0, 10
Mr. Slate	84 (b)	I	Analytic Mechanics. Supplementary course to the preceding		2	2	8 0, 8	2 0, 2	2 0, 2
Prof. Hesse	85	II	Hydraulics. Investigations in the action of forces upon liquid bodies, either in producing equilibrium (hydrostatics), or motion (hydrodynamics), such as: pressure, stability, flow through orifices, pipes, etc., under the influence of gravity, inertia, outer and inner friction.	Lectures. No text-book used	4	------	8 0, 8	7 0, 7	5 0, 5
Prof. Hesse	86	V	Thermodynamics. Mechanical theory of heat and its application to the theory and construction of motors, steam, gas, and hot-air engines, ice-machines, and air compressors for transmission of power.	Lectures. No text-book used	2	2	5 0, 5	2 0, 2	2 0, 2
Prof. Hesse	87	VII	Laboratory. Construction and experimenting.	No text-book used	6	6	5 0, 5	0 0, 0	------

Record of Subjects Taught and of Attendance in each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			CIVIL ENGINEERING.						
Mr. Raymond	88	I	Surveying. Land, topographical, mine, and higher surveying. Theory and use of the solar compass, plane table, and sextant. Preliminary and location surveys for roads, railroads, and canals, with methods of laying out the work, laying out turnouts, calculating earthwork and masonry, making estimates, etc. Theory of the construction and use of diagrams for computing earthwork and masonry. Theory and use of the planimeter.	Davies' Land Surveying, Searles' Field Engineering	4	4	14 1, 15	11 0, 11	10 0, 10
Mr. Raymond	89	II	Field Practice and Mapping. Adjustment of instruments. Practice in plane and topographical surveying. Preliminary and location surveys for a line of railroad, together with the staking out of the work, the making of estimates, etc. Finished maps of all surveys were required.	No text-book used	9	9	15 0, 15	14 0, 14	14 0, 14
Professor Soulé	90	III	Strength of Materials. Character and properties of building materials, such as iron, steel, other metals, timber, natural and artificial stones; practice in the selection of good and poor specimens. Discussions of the elastic and ultimate resistance of these materials; deduction of formulæ for safe and for rupturing loads of beams, etc.; designs of beams of uniform strength; discussion of torsive stresses and plane of maximum shear; discussion of internal strains. Analytical and graphical methods employed. Lectures and numerous problems.	Lectures. Wheeler's Civil Engineering	4	------	6 0, 6	6 0, 6	5 0, 5
Professor Soulé	91	IV	Engineering Structures. Theory of joints and framing in wood and iron; boiler plate joints. Theory and construction of solid and open built girders of roof trusses, bridge trusses, and railway bridges generally. Theory of suspension bridges; and of foundations on land and under water.	Lectures. Wheeler's Civil Engineering	------	4	2 0, 2	0 0, 0	------ ------
Professor Soulé	92	V	Sanitary Engineering. Lectures on the theory and construction of sewers and drains for cities.	No text-book used	2	2	2 0, 2	0 0, 0	------ ------
			ASTRONOMY.						
Professor Soulé	93	I	Practical Astronomy. *First Term:* General facts and principles underlying the science of Astronomy, physical and spherical, with solutions of many problems, particularly those relating to the determination of latitude, longitnde, time, etc. *Second Term:* A continuation and completion of the first term's course.	Newcomb and Holden's Astronomy	3	3	2 0, 2	0 0, 0	------ ------
Professor Soulé	94	II	Descriptive Astronomy. A short course comprehending a popular outline of the subject.	Newcomb and Holden's Astronomy, Briefer Course	------	3	8 3, 11	9 3, 12	9 3, 12

RECORD OF SUBJECTS TAUGHT, AND OF ATTENDANCE IN EACH CLASS PURSUING THEM—Continued.

INSTRUCTOR.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week.		In Attendance at Recitations	At Final Examinations.	
					1st Term	2d Term		In Attendance	Passed
			MINING, METALLURGY, AND ASSAYING.						
Professor Christy	95	I	MINING. Nature and occurrence of ores. Mining laws of the United States and Mexico. Location of claims. Prospecting, artesian and diamond-drill boring. Excavation, explosives, and blasting. Tunnelling and shaft sinking. Winning and exploration of deposits. Exploitation by deep mining and open cut work. Systems of tramming, hoisting, pumping, draining, lighting, and ventilating. General organization and administration.	Lectures. No text-book used. References to André's Explosives and Blasting, Callon's Lectures on Mining, Lottner-Serlo's Bergbaukunde, Bowie's Hydraulic Mining, the Engineering and Mining Journal, Transactions of American Institute of Mining Engineers, Annáles des Mines, etc.	2	2	9 0, 9	7 0, 7	7 0, 7
Professor Christy	96	II	METALLURGY. *General Part:* Classification of ores and methods of their reduction. Ore crushing and ore-crushing machinery. Sampling of ores and products. Fuels and their relative value as heat producers. Fluxes and refractory materials. Furnace construction and classification. Metallurgical products. *Special Part:* A detailed study of methods in successful use for the reduction of the ores of gold, silver, lead, and quicksilver.	Lectures. No text-book used. References to Percy's Works on Fuels, Lead, Gold and Silver, Kerl's Allgemeine Hüttenkunde, Kerl's Metallhüttenkunde, and to the current periodicals	3	3	11 0, 11	9 0, 9	8 0, 8
Professor Christy	97	III	ASSAYING. Fire assays of ores of lead. Treatment of gold and silver and their ores by cupellation, scorification and crucible method; oxidizing and chloridizing, roasting and leaching. Fire assays of antimony, tin, nickel, cobalt, copper, iron, and fuels. Volumetric and electrolytic methods with copper, nickel, cobalt. Humid assay of silver bullion.	Lectures and Laboratory Work. No text-book used. References to Kerl's Probirkunst and Probirbuch, Balling's Probirkunde and Ricketts' Assay Schemes	6	6	12 0, 12	10 0, 10	10 0, 10

Record of Subjects Taught and of Attendance in Each Class Pursuing Them—Continued.

Instructor.	Number	No. of Course as given in University Register	Title and Description of Course.	Text-Books Used.	No. Hours a Week. 1st Term	No. Hours a Week. 2d Term	In Attendance at Recitations	At Final Examinations. In Attendance	At Final Examinations. Passed
			AGRICULTURE AND ENTOMOLOGY.						
Mr. Wickson	98	II	Elementary and Economic Entomology. Demonstrations both from type collections and living specimens.	No text-book used	1	1	3 0,3	1 0,1	1 0,1
Professor Hilgard	99	IV	Viticulture. A special course in Vinification and the chemistry and analysis of wines (during two months of the second term).	No text-book used	------	23	3 0,3	0 0,0	------ ------
			MILITARY SCIENCE.						
Professor Hutton	100	I	Tactical Instruction in the Field. (To Freshmen.)	Upton's Infantry Tactics	2	2	50 0,50	50 0,50	50 0,50
Professor Hutton	101	II	Target Practice and Camp Duty. (To Sophomores.)	Reed's Military Science and Tactics, with lectures on special subjects	2	2	37 0,37	34 0,34	34 0,34
Professor Hutton	102	III	A brief course in Military Engineering and Fortifications, strategy and tactics, ordnance and gunnery, military law, courts and boards, military signaling, modern improvements in the art of war and a study of great battles, regulations of the U. S. Army and of the National Guard, etc. (To Juniors and Seniors.)	Hornley's Operations of War, with lectures on special subjects	2	2	46 0,46	43 0,43	43 0,43

Of the twenty-eight courses, not included in this table, which were announced at the beginning of the academic year, twenty-six were not given by reason of an insufficient number of students electing them; these were—five courses in physics, four in mathematics, four in mineralogy, three in mechanical engineering, two in philosophy, two in agriculture, and one in each of the departments of Greek, Latin, English, Spanish, Chemistry, and Civil Engineering. Courses I and II in History (as numbered in the Register), and the last third part of Course III, were not given in consequence of there being an inadequate teaching force in the department of History and Political Economy.

For the course in Philosophy XXIV, the continuation of course XXIII (number 7 in the table) was substituted, and courses II and III in Botany (as described in the Register) were merged into one course—number 74. The course in General Physics was broken into two parts, numbers 58 and 59, it having been found impossible to confine the entire scheme of lectures within the time prescribed for the regular course in that subject.

DEPARTURES IN METHOD, AND NEW SUBJECTS.

The class in Field Practice and Mapping (Course II in Civil Engineering) were given the option, at the beginning of the second term, of doing their field work in term-time, or of postponing it until the Summer vacation, with the prospect of being able to do more consecutive work on a somewhat larger scale than is usual. Nine members of the class chose the latter alternative and spent four weeks of the summer vacation surveying in the field near the mouth of the Russian River, under the superintendence of the Instructor in Civil Engineering, working five days in the week, from seven o'clock in the morning till six in the evening. With the topographical survey they covered one and a third square miles, varying in elevation from sea level to eight hundred feet above it, locating contour lines every twenty feet for the first one hundred, and every fifty feet above that. They also ran a railroad line of about a mile and a half, which they located and cross-sectioned, and for which the computations for the necessary excavations were made. A field map of the topographical survey, and a map and profile of the railroad line were made.

During the latter half of the second term the Professor of Agriculture gave, for the first time, a course of lectures on the chemistry and analysis of wines (number 99 in the table), with laboratory practice in analysis and fermentation. This course will hereafter be offered annually, and will be expanded to suit the requirements of students desiring to qualify themselves as experts in viticulture and vinification.

The courses in Botany, which had been intermitted for two years, by reason of a vacancy in the instructorship in that department, have been given by Mr. Greene during the past year.

Two courses in Spanish were offered for the first time in several years by the Instructor in French, only one of which, however, was elected by students.

It was announced in the Register that the students' astronomical observatory would be ready for use during the latter part of the year, but the instruments were barely in position at the close of the year, and instruction in practical astronomy was therefore not begun. Everything is, however, now in readiness for that work, the Professor in charge having spent the summer vacation in adjusting and testing the instruments.

The equipment of the new metallurgical laboratory, which is progressing as fast as the funds appropriated for that purpose become available, will, it is hoped, be complete in time to make it possible to begin work during the next academic year.

The mechanical laboratory was in working order during the second term, and experiments were conducted by the Professor in charge and a class of graduate students—Mr. Jennings, C.E., graduate of Harvard, and Mr. Bossé and Mr. Dikeman, graduates of the University of California. In the mechanical shops, practice with tools and machinery was given to all of the students in the College of Mechanics.

OUTLINE OF THE UNDERGRADUATE COURSES.

The following tables present an outline of the work, prescribed and elective, in the eight undergraduate courses, as at present constituted and maintained jointly by the several faculties at Berkeley:

OUTLINE OF THE CLASSICAL COURSE.

Prescribed Work.

Reference No. to Table of Courses.		Average No. of Hours a Week.
12.	Political Economy VI (one term)	4
18.	Greek I (two terms)	4
19.	Greek II (two terms)	4
22.	Latin I (two terms)	4½
23.	Latin II (two terms)	3
26.	Latin V (one term)	1
27.	English I (two terms)	3½
29.	English III (one term)	3
30.	English IV (one term)	3
46.	Mathematics I (1) (two terms)	4
48.	Mathematics I (2) (one term)	3
58.	Physics I (one term)	4

Of written work in English, twenty-four themes are required during the four years.

Elective Work.

Of which the equivalent of fifty-nine hours a week for one term must be taken.

Reference No. to Table of Courses.		Average No. of Hours a Week.
1.	Philosophy I (two terms)	1
2.	Philosophy II (two terms)	3
3.	Philosophy III (one term)	2
4.	Philosophy IV (one term)	2
5.	Philosophy V (one term)	2
8.	Philosophy VI (one term)	2
—.	Philosophy VII (one term)	2
—.	Philosophy VIII (one term)	2
13.	Political Economy VII (one term)	4
15.	Political Economy IX (one term)	4
8.	History II (two terms)	4
9.	History III (three terms)	4
11.	History IV (one term)	4
14.	History VIII (one term)	4
16.	Philology I (one term)	2
17.	Philology II (one term)	2
20.	Greek III (two terms)	2½
21.	Greek IV (two terms)	2½
—.	Greek V (one term)	1
24.	Latin III (two terms)	3½
25.	Latin IV (two terms)	3½
—.	Latin VI (one term)	2
31.	English V (one term)	3
32.	English VI (one term)	3
33.	English VII (one term)	3
34.	English IX (one term)	3
37, 38.	German I (four terms)	3
39.	German II (two terms)	3
40.	German III (two terms)	2
41, 42.	French I (four terms)	3
43.	French II (two terms)	3
44.	French III (two terms)	2
52.	Mathematics III (two terms)	4
—.	Mathematics IV (one term)	2
—.	Mathematics (V and VI), VII, VIII, or IX (two terms)	2
58.	Physics I (one term)	4
63.	Chemistry I (one term)	3
64.	Chemistry II (two terms)	2
73.	Botany I (one term)	3
74.	Botany II (one term)	3
75.	Zoology I (two terms)	2
76.	Geology II (two terms)	3
77.	Mineralogy I (one term)	2
94.	Astronomy II (one term)	3

During the Sophomore and Junior years the elections must be made between French, or German, and studies in History and Political Economy, and the course of study elected must be pursued for two years. In other subjects the elections are unrestricted.

OUTLINE OF THE LITERARY COURSE.

Prescribed Work.

Reference No. to Table of Courses.		Average No. of Hours a Week.
12.	Political Economy VI (one term)	4
8.	History II (two terms)	4
22.	Latin I (two terms)	4
23.	Latin II (two terms)	3
27.	English I (two terms)	4
29.	English III (one term)	3
30	English IV (one term)	3
37, 38.	German I (four terms)	3½
	or	
41, 42.	French I (four terms)	3½
46.	Mathematics I (three terms)	4
58.	Physics I (one term)	4
63.	Chemistry I (one term)	4

Of written work in English, twenty-four themes are required during the four years.

Elective Work.

Of which the equivalent of fifty-four hours a week for one term must be taken.

Reference No. to Table of Courses.		Average No. of Hours a Week.
1.	Philosophy I (two terms)	1
2.	Philosophy II (two terms)	3
3.	Philosophy III (one term)	2
4.	Philosophy IV (one term)	2
5.	Philosophy V (one term)	2
6.	Philosophy VI (one term)	2
—.	Philosophy VII (one term)	2
—.	Philosophy VIII (one term)	2
13.	Political Econ. VII (one term)	4
15.	Political Econ. IX (one term)	4
9.	History III (three terms)	4
11.	History IV (one term)	4
14.	History VIII (one term)	4
14.	Philology I (one term)	2
15.	Philology II (one term)	2
—.	Greek V (one term)	1
24.	Latin III (two terms)	3½
25.	Latin IV (two terms)	3½
—.	Latin VI (one term)	2
31.	English V (one term)	3
32.	English VI (one term)	3
33.	English VII (one term)	3
34.	English IX (one term)	3
39.	German II (two terms)	3
40.	German III (two terms)	2
43.	French II (two terms)	3
44.	French III (two terms)	2
52.	Mathematics III (two terms)	4
—.	Mathematics (V and VI), VII, VIII, or IX (two terms)	2
58.	Physics I (one term)	4
64.	Chemistry II (two terms)	2
73.	Botany I (one term)	3
74.	Botany II (one term)	3
75.	Zoölogy I (two terms)	2
76.	Geology II (two terms)	3
77.	Mineralogy I (one term)	2
94.	Astronomy II (one term)	3

In the first two years the only elections allowed are between French and German. In the last two years elections are unrestricted.

OUTLINE OF THE COURSE IN LETTERS AND POLITICAL SCIENCE.

Prescribed Work.

Reference No. to Table of Courses.		Average No. of Hours a Week.
12.	Political Economy VI (one term)	4
13.	Political Economy VII (one term)	4
15.	Political Economy IX (one term)	4
—.	History I (two terms)	4
8.	History II (two terms)	4
9.	History III (three terms)	4
14.	History VIII (one term)	4
46.	Mathematics I (three terms)	4
58.	Physics I (one term)	4
63.	Chemistry I (one term)	4

Written work in English, twenty-four themes during the four years.

During the Freshman and Sophomore years two languages must be chosen, choice being made between Greek, Latin, English, and German, and the last, if elected, must be studied two years. These subjects are included in the following elective list:

Elective Work.

Of which the equivalent of sixty-two hours a week for one term must be taken.

Reference No. to Table of Courses.		Average No. of Hours a Week.
1.	Philosophy I (two terms)	1
2.	Philosophy II (two terms)	3
3.	Philosophy III (one term)	2
4.	Philosophy IV (one term)	2
5.	Philosophy V (one term)	2
6.	Philosophy VI (one term)	2
—.	Philosophy VII (one term)	2
—.	Philosophy VIII (one term)	2
11.	History IV (one term)	4
—.	History V (one term)	2
18.	Greek I (two terms)	4
19.	Greek II (two terms)	4
22.	Latin I (two terms)	4
23.	Latin II (two terms)	3
27.	English I (two terms)	4
29.	English III (one term)	3
30.	English IV (one term)	3
31.	English V (one term)	3
32.	English VI (one term)	3
33.	English VII (one term)	3
34.	English IX (one term)	3
37, 38.	German I (four terms)	4
39.	German II (two terms)	2
40.	German III (two terms)	2
43.	French II (two terms)	3
44.	French III (two terms)	2
—.	Mathematics V, VI, VII, VIII, or IX (two terms)	2
58.	Physics I (one term)	4
75.	Zoology I (two terms)	2
76.	Geology II (two terms)	3

OUTLINE OF THE COURSE IN AGRICULTURE.

Prescribed Work.

Reference No. to Table of Courses.		Average No. of Hours a Week.
27.	English I (two terms)	4
28.	English II (one term)	1
37, 38.	German I (four terms)	4
	or,	
41, 42.	French I (four terms)	3½
12.	Political Econ. VI (one term)	4
13.	Political Econ. VII (one term)	4
49, 51.	Mathematics II (two terms)	5½
58.	Physics I (two terms)	4
60.	Physical Lab. V (one term)	3
63.	Chemistry I (one term)	4
64.	Chemistry II (two terms)	2
67.	Chemistry V (two terms)	9
68.	Chemistry VI (four terms)	12
66.	Chemistry IV (two terms)	2
—.	Agricultural Chem. I (two terms)	3
98.	Entomology II (two terms)	1
—.	Agriculture III (two terms)	3
73.	Botany I (one term)	3
74.	Botany II (one term)	2
75.	Zoölogy I (two terms)	2
76.	Geology II (two terms)	3
77.	Mineralogy I (two terms)	2
78.	Mineralogy II (one term)	2
79.	Instrumental Drawing I (two terms)	3
88.	Surveying I (one term)	2
89.	Field Practice II (one term)	5
—.	A special investigation or thesis is required at graduation.	

Written work in English: Eighteen themes during the four years.

Elective Work.

Of which the equivalent of nine hours a week for one term must be taken.

39.	German II (one term)	2
43.	French II (one term)	2
69.	Chemistry VII (one term)	3
56.	Mathematics IX (two terms)	2
94.	Astronomy II (one term)	3

OUTLINE OF THE COURSE IN MECHANICS.

All the work, except Mathematics VIII, is prescribed; but French and German are alternative.

Reference No. to Table of Courses.		Average No. of Hours a Week.
27.	English I (two terms)	4
28.	English II (one term)	1
37–39.	*German I, II (six terms)	3½
	or,	
41–43.	French I, II (six terms)	3
49, 51.	Mathematics II (two terms)	5½
52.	Mathematics III (two terms)	4
55.	Mathematics VIII (two terms)	2
79.	Instrumental Drawing and Descriptive Geometry I (two terms)	3
84.	Analytic Mechanics I (two terms)	6
58.	Physics I (two terms)	4
61.	Physical Lab. VI (one term)	3
62.	Physical Lab. VII (one term)	6
81.	Mech. Drawing III (two terms)	6
82.	Graphostatics IV (one term)	2
90.	Strength of Materials III (one term)	4
85.	Hydraulics II (one term)	4
—.	Hydraulic Machines III (one term)	2
83.	Construction V (two terms)	6
—.	Kinematics IV (two terms)	2
—.	Machine Construction VI (one term)	4
87.	Mech. Laboratory VII (two terms)	6
86.	Thermodynamics V (two terms)	2
63.	Chemistry I (one term)	4
64.	Chemistry II (two terms)	2
70.	Chemistry VIII (one term)	4
67.	Chemistry V (two terms)	10
75.	Zoölogy I (two terms)	2
76.	Geology II (two terms)	3
—.	A written thesis on some subject connected with mechanical engineering.	

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*German preferred.

Written work in English: Eighteen themes during the four years.

OUTLINE OF THE COURSE IN MINING.

All the work is prescribed; but numbers 88, 89, and 68 are alternative, and 62, 83, and 87, are alternative during one term.

Reference No. to Table of Courses.		Average No. of Hours a Week.
27.	English I (two terms)	4
28.	English II (one term)	1
37, 39.	German (four terms)	4
	or	
41, 43.	French (four terms)	3½
49, 51.	Mathematics II (two terms)	5½
52.	Mathematics III (two terms)	4
88.	*Surveying I (one term)	4
89.	*Field Practice II (two terms)	9
79.	Instrumental Drawing and Descriptive Geometry I (two terms)	3
81.	Mechanical Drawing III (two terms)	6
58.	Physics I (two terms)	3
61.	Physical Lab. VI (one term)	3
62.	†Physical Lab. VII (one term)	6
84.	Analytic Mechanics I (two terms)	4
82.	Graphostatics IV (one term)	2
90.	Strength of Materials III (one term)	4
85.	Hydraulics II (one term)	4
83.	†Construction V (two terms)	6
87.	†Mechanical Laboratory VII (one term)	6
63.	Chemistry I (one term)	4
64.	Chemistry II (two terms)	2
70.	Chemistry VIII (one term)	4
67.	Chemistry V (two terms)	10
68.	*Chemistry VI (two terms)	12
77.	Mineralogy I (two terms)	2
78.	Mineralogy II (two terms)	2
76.	Geology II (two terms)	3
95.	Mining I (two terms)	3
96.	Metallurgy II (two terms)	3
97.	Assaying III (two terms)	6
—.	A written thesis on some subject connected with mining or metallurgy.	

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*Alternatives. †Alternatives for one term.

Written work in English: Eighteen themes during the four years.

OUTLINE OF THE COURSE IN CIVIL ENGINEERING.

All the work is prescribed with the exceptions of the alternative in French and German and the optional study, Engineering Specifications:

Reference No. to Table of Courses.		Average No. of Hours a Week.
27.	English I (two terms)	4
28.	English II (one term)	1
37, 39.	*French I (four terms)	3½
	or	
41, 43.	German I (four terms)	4
49, 51.	Mathematics II (two terms)	5½
52.	Mathematics III (two terms)	4
79.	Instrumental Drawing and Descriptive Geometry I (two terms)	3
84.	Analytic Mechanics I (two terms)	4
58.	Physics I (two terms)	3
61.	Physical Laboratory VI (one term)	3
62.	Physical Laboratory VII (one t'rm)	6
88.	Surveying I (two terms)	4
89.	Field Practice II (two terms)	9
—.	Mapping II (two terms)	6

Reference No. to Table of Courses.		Average No. of Hours a Week.
82.	Graphostatics IV (one term)	2
90.	Strength of Materials III (one term)	4
85.	Hydraulics II (one term)	4
83.	Construction V (two terms)	9
91.	Engineering Structures (one term)	4
92.	Sanitary Engineering (two terms)	2
93.	Astronomy I (two terms)	3
—.	†Eng. Specifications VI (two terms)	2
63.	Chemistry I (one term)	4
64.	Chemistry II (two terms)	2
67.	Chemistry V (two terms)	10
70.	Chemistry VIII (one term)	4
75.	Zoölogy I (two terms)	2
76.	Geology II (two terms)	3
—.	A written thesis on some subject connected with civil engineering.	

Written work in English: Eighteen themes during the four years.

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* French preferred. † Optional.

OUTLINE OF THE COURSE IN CHEMISTRY.

Prescribed Work.

Reference No. to Table of Courses.		Average No. of Hours a Week.
27.	English I (two terms)	4
28.	English II (one term)	1
37, 39.	German I (four terms)	4
41.	French I (two terms)	3
12.	Political Econ. VI (one term)	4
52.	Mathematics II (two terms)	5½
58.	Physics I (two terms)	4
60.	Physical Lab. V (one term)	3
63.	Chemistry I (one term)	4
64.	Chemistry II (two terms)	2
67.	Chemistry V (two terms)	10½
65.	Chemistry III (two terms)	2

Reference No. to Table of Courses.		Average No. of Hours a Week.
66.	Chemistry IV (two terms)	2
68.	Chemistry VI (four terms)	16½
70.	Chemistry VIII (one term)	4
73.	Botany I (one term)	3
75.	Zoölogy I (two terms)	2
76.	Geology II (two terms)	3
77.	Mineralogy I (two terms)	2
78.	Mineralogy II (two terms)	4
—.	A written thesis, embodying the results of careful experimental work in the laboratory.	

Written work in English: Eighteen themes during the four years.

Elective Work.

In addition to the foregoing prescribed studies, students must elect six subjects from the following list, each to be pursued at least one term:

—.	Mathematics: Any available elective (each two terms)	2
79.	*Instrumental Drawing and Descr. Geometry I (two terms)	3
88.	Surveying I (one term)	2
—.	Field Practice II (one term)	5
94.	Astronomy II (one term)	3
73.	Botany II (one term)	3
74.	Botany II (one term)	2
69.	Chemistry VII (one term)	3
—.	*Agricultural Chem. I (two terms)	3

71.	Chemistry X (two terms)	1
—.	Petrography III (two terms)	2
96.	Metallurgy II (two terms)	3
97.	Assaying III (one term)	6
—.	English: Any available elective (each one term)	3
8.	History II (two terms)	4
9.	History III (three terms)	4
—.	History V (one term)	2
13.	Political Econ. VII (one term)	4

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* If begun, must be continued through the respective courses.

COMPARATIVE STATISTICS OF UNDERGRADUATE COURSES.

Out of the foregoing data the following table of comparative statistics of the eight undergraduate courses has been put together. The unit of comparison is the term; or more explicitly, the numbers in the first three double rows represent the number of hours a week of prescribed and elective work (in recitation and in laboratory), which the student would be required to do, if the whole four years' course were completed in one term. In order to get the average number of hours for a single week, each number must be divided by eight. The fourth row is obtained by multiplying the upper numbers in the third double row by three, adding these products to the lower numbers and dividing this sum by eight. In this calculation it is assumed that the work of preparation for recitation requires two hours, making three for the preparation and recitation together. Laboratory work is supposed to require no preparation.

The averages reached in the fourth row should be regarded as only approximate. In many cases where elections are necessary in order to make up a term's work out of the subjects offered to him, the student is compelled to exceed the minimum number (forty-five a week) required by the regulations; and in the five scientific courses the average for the first year is smaller—footing up only forty-five hours—while for the last three years it is considerably larger than that given in the table.

COURSES.		Classical	Literary	Letters and Political Science	Agriculture	Mechanics	Mining	Civil Engineering	Chemistry
Number of hours of prescribed work.	In recitation	64	74	64	99	109	*102	106	85
	In laboratory	------	------	------	79	69	*85	87	104
Number of hours of elective work to be added.	In recitation	59	54	62	9	4	------	------	†12
	In laboratory	------	------	------	------	------	------	------	------
Total number of hours required to be taken.	In recitation	123	128	126	108	113	102	106	97
	In laboratory	------	------	------	79	69	85	87	104
Average number of hours of work expected of the student each week		$46\frac{1}{8}$	48	$47\frac{1}{8}$	$50\frac{3}{8}$	51	*$48\frac{7}{8}$	$50\frac{5}{8}$	$49\frac{3}{8}$
Number of distinct prescribed courses		12	11	10	24	26	27	25	20
Number of dictinct elective courses		48	41	35	5	1	------	1	‡27

* The alternative studies of the Mining Course would give in this column the numbers 98, 91, and $48\frac{5}{8}$ respectively.

† Or equivalent work in recitation and laboratory combined.

‡ Includes six courses in Mathematics and six in English.

SOCIAL AND RECREATIVE WORK.

There exist at the University and under its auspices, maintained either wholly or in part by University effort, the following societies:

1. The Longfellow Memorial Association, organized in 1883, at the sug-

gestion of Professor Cook. The association is affiliated with the parent society in Cambridge. Its aim is to combine a study of general literature with social recreation, and to promote, by contact with good society, social intercourse of an elevated character amongst students. During the year essays have been read before the society on the following subjects: Epic Poetry, by Mrs. Kate Fisher, of Oakland; Dramatic Poetry, by the Rev. C. A. Savage; Lyric Poetry, by Mr. J. C. Rowell; Poetical Readings, with critical comments, by Professor Cook; Critical Readings, Milton's Lycidas and Christmas Hymn, by Professor Joseph Le Conte. The programmes of the meetings were varied by short illustrative readings and musical recitals. Under the auspices of the society two interesting and instructive series of Shakespeare recitals were given by Mr. Locke Richardson, in the Assembly Hall, and were listened to by very enthusiastic audiences of students and citizens. Two other elocutionists gave readings before the society. For its regular monthly meetings, the citizens of Berkeley have very generously thrown open the doors of their pleasant homes to its members.

2. The Political Science Club, organized in 1882 at the suggestion of Professor Moses, for the purpose of investigating and discussing questions of Political Economy and Social Science—work in a measure supplementary to that done by members of the club in the class-room. Among the questions discussed by the club were the following: The Southern Negro; England a Truer Democracy than the United States; The Land Question Stated; A Problem of Government; The Indian Question; The English Colonies; Home Rule for Ireland; Some Phases of Coöperation; Past and Present Phases of Boycotting. The discussions have been conducted by students. The meetings of the club are held fortnightly, at the residence of Professor Moses.

3. The Berkeley Choral Society first permanently organized and formally affiliated with the University in February, 1885. The society has held weekly musical rehearsals in the students' literary hall, and has given during the year three choral concerts in the Assembly Hall, at which were rendered, in addition to songs and shorter pieces, portions of Mendelssohn's Forty-second and Ninety-fifth Psalms; Rubenstein's Oratorio, Paradise Lost; Schumann's Gipsy Life; Wagner's Spinning Chorus in the Flying Dutchman; Max Bruch's Flight of the Holy Family; and Gounod's Sacred Trilogy, Mors et Vita. The working force of the society has averaged about fifty voices, conducted by Mr. William Toepke, of San Francisco. The work of the society is confined strictly to classical music of the highest order. There were also given in the Assembly Hall, in February and March, under the auspices of the society, two instrumental concerts, the one by a quartette conducted by Mr. Hermann Brandt, the other by a septette, conducted by Mr. Henry Heyman. Should opportunity offer, the society contemplates providing in the near future lectures on musical subjects.

4. The Science Club, organized about two years ago, and composed of members of the scientific faculties. Papers on the following subjects were read before the Club during the year: On Absolute Measures in Galvanism, by Mr. Slate; The Work of a Manual Training School, by Mr. Raymond; Asphaltum Deposits of California, by Professor Hilgard; The Occurrence of Fats in Milk, by Mr. Wickson; Phosphoric and Hydrobromic Acids, by Mr. Sommer; Larval History of Pacific Coast Coleoptera, by Mr. Rivers; Dynamo-Electric Machines, by Mr. Harding; Physiological Action of Alcohol, by Mr. O'Neill; Chemical Analysis of Mattes, by Mr. Weber; The Cholera Epidemic in Italy, by Professor Soulé; On the Determination

of the Size of the Particles of Floating Matter by means of the Phenomenon of Diffraction, by Professor John Le Conte.

5. The Engineering Club, organized in March, 1886, composed of members of the faculties, graduate students, and students of the Senior and Junior classes. The Club meets monthly, discusses engineering subjects, and indexes engineering literature. During the ensuing year prominent engineers of the Pacific Coast will be invited to take part in the discussions of the Club.

STUDENTS' SOCIETIES.

The students maintain two literary societies, the Durant and the Neolean, whose existence is recognized by the authorities of the University. Several of the Professors have willingly responded to invitations to give short talks or addresses to the members of these societies on the occasions of their regular meetings.

The Students' Coöperative Society, which is also recognized by University authority and is given comfortable quarters in North Hall, has done good work during the year in furnishing books to students at considerable discount from publishers' prices.

The students have also maintained, as in former years, two college journals, one weekly and one fortnightly. These have been conducted without supervision or dictation on the part of the various college authorities.

Very respectfuly yours,

Irving Stringham, Dean.

Berkeley, Cal., 1st October, 1886.

Report of the Dean of the Hastings College of the Law.

PROGRESS, CONDITION, AND WANTS.

This college, since its organization in 1878, has given a legal education to a large number of persons. The graduates now number two hundred and two, and besides them many others have received instruction, but have never completed the prescribed course, and have, therefore, never graduated. A considerable proportion of the graduates are, however, not engaged in the practice of the law. Men in other pursuits have sometimes found it an advantage to attend the lectures. Indeed, it was the idea of the founder, not only to educate lawyers, but to give business men an opportunity to become acquainted with legal principles.

It was for this reason that it was at first deemed advisable to admit any one to the college who possessed a good English education. Applicants under this general rule were, in reality, not required to pass any entrance examination. Students of limited education were, consequently, sometimes admitted. The result was a loss of time to themselves, and a detriment to the college. Experience has demonstrated that the study of the law cannot be pursued with profit, without considerable preliminary training, and the only satisfactory manner in which to ascertain whether applicants possess the requisite knowledge and capacity is to hold formal entrance examinations.

The Board of Directors have, therefore, decided that hereafter no one shall be admitted to the privileges of the school who shall not have passed a satisfactory examination for admission, unless he shall have graduated from some approved institution of learning.

The educational qualifications for entrance are now about the same as those demanded to enter the Literary Course at Berkeley. An improvement may also be noted in the increased severity of the examinations of students for promotion and graduation.

The instruction is by means of lectures, and recitations from these lectures, and from text-books. More attention has lately been given than formerly to oral exercises in the class-room, with satisfactory results. Cases are now, also, regularly assigned for argument in Moot Court, and the work in this direction has been of the utmost benefit.

A Professor of Municipal Law and one of Legal Ethics compose the working corps of instructors. While it is possible for them to give instruction in the most important branches of the law, some special subjects of importance must necessarily be left untouched.

The State has regularly paid, in accordance with the Act founding the College, $7,000 per year, and in addition thereto has paid the rent of the lecture-room, with the exception of a short time, when the City and County of San Francisco provided a room free of charge.

The funds have been economically managed, and the College has a considerable sum to its credit in the bank. A building belonging to the College and a library for the use of students are much desired.

Respectfully submitted.

Jos. W. Winans,
Dean of the College.

San Francisco, August 15, 1886.

CONDITIONS OF ADMISSION—GENERAL LIST OF PREPARATORY SUBJECTS.

Applicants for admission to the Junior Class must be at least eighteen years of age; must deposit with the Registrar a certificate of good moral character; and must pass a satisfactory examination in the following subjects:

1. English. A short composition, correct in spelling, punctuation, paragraphing, and grammar, upon a subject announced at the time of the examination. The subject will be taken in 1887, and thereafter, until further notice, from the following works: Scott's Lady of the Lake, Scott's Ivanhoe, Irving's Alhambra, Thackeray's Newcomes, Shakespeare's Merchant of Venice and Julius Cæsar (Rolfe's or the Clarendon Press edition).

Applicants will also be required to analyze sentences from these works, and to pass an examination on the first seventy-one lessons in Kellogg's Text-book on Rhetoric.

2. Arithmetic. Including the metric system, and the technical parts of Commercial Arithmetric, viz.: banking, profit and loss, commission, taxes, duties, stocks, insurance, exchange, and average payments.

3. Algebra. To Quadratic Equations, including the various methods of factoring, the theory of exponents, integral and fractional, positive and negative, and the calculus of radicals.

4. Plane Geometry.

5. History and Geography. History of the United States and of England, and the general facts of Physical and Political Geography. Barnes' Brief History of the United States, Gardiner's History of England for Schools, and the geographies used in the first grade grammar schools, will serve to indicate the amount of knowledge expected.

6. LATIN. Cæsar, Gallic War, Books I–IV (or Civil War, Books I–II); Cicero, the Four Catilinarian Orations, and the Orations *Pro Archia Poeta and Pro Lege Manilia;* Vergil, Æneid, Books I–VI; with questions in each case, on the implied grammar, on the subject-matter and the corresponding archæology, and, in the case of Vergil, on the prosody.

Graduates of the University of California will be admitted without examination.

Graduates of other institutions of learning may, also, in the discretion of the Board of Directors, be admitted without examination.

The examinations will be held at the times and places announced for the holding of the entrance examinations to the undergraduate departments of the University. In 1886 the examinations will be held at Berkeley, on September twenty-third, twenty-fourth, and twenty-fifth. Applicants for admission will not be examined at any other time, unless for reasons of the most exceptional urgency. Information concerning the character of the examinations can be obtained by addressing CHAS. A. RAMM, Recorder, Berkeley.

Applicants must file applications for admission and certificates of good moral character with the Registrar, PERRIE KEWEN, 121 Post Street, prior to examination at Berkeley.

REPORT OF THE DEAN OF THE TOLAND COLLEGE OF MEDICINE.

FACULTY.

Edward S. Holden, LL.D., President.

G. A. Shurtleff, M.D., Emeritus Professor of Mental Diseases and Medical Jurisprudence.

R. Beverly Cole, A.M., M.D., M.R.C.S., England, Professor of Obstetrics and Gynecology.

M. W. Fish, M.D., Professor of Physiology and Microscopy.

W. F. McNutt, M.D., M.R.C.P., Edinburgh, etc., Professor of Principles and Practice of Medicine.

Robert A. McLean, M.D., Professor of Clinical and Operative Surgery, Dean of the Faculty.

W. E. Taylor, M.D., Professor of Principles and Practice of Surgery.

George H. Powers, M.D., Professor of Ophthalmology and Otology.

F. B. Kane, M.D., F.R.C.S.I., Professor of Clinical Medicine and Pathology.

A. L. Lengfeld, M.D., Professor of Materia Medica and Medical Chemistry.

William B. Lewitt, M.D., Professor of Anatomy.

F. H. Terrill, M.D., Professor of Therapeutics.

Benjamin R. Swan, M.D., Professor of Diseases of Children.

William H. Mays, M.D., Professor of Mental Diseases and Medical Jurisprudence.

Washington Ayer, M.D., Professor of Hygiene.

L. A. Sabey, Curator.

John G. Day, M.D., Demonstrator of Anatomy.

Arnold A. D'Ancona, A.B., M.D., Assistant to the Chair of Physiology.

Winslow Anderson, M.D., Assistant to the Chair of Materia Medica and Medical Chemistry.

Henry W. Dodge, M.D., Assistant to the Chair of Clinical Medicine and Pathology.

Jules Simon, M.D., Assistant to the Chair of Mental Diseases and Medical Jurisprudence.

COLLEGE DISPENSARY STAFF.

C. G. Kenyon, M.D., William B. Lewitt, M.D., Surgery.

Jules Simon, M.D., Nervous Diseases.

Luke Robinson, M.D., M.R.C.P., England.

H. W. Dodge, M.D., Medicine.

The Medical Department is in urgent want of a well equipped college building in a central location. The building now in use, known as the Toland College, is in a most inconvenient place at the northern end of

Stockton Street, near the bay. It is about five miles from the City and County Hospital, where the clinical instruction is given three days in the week. It is difficult of access from the central parts of the city, and from the residences and boarding-places of the majority of the students.

When the college building was first used for medical lectures, the City and County Hospital occupied buildings within one block, and at that time its situation was convenient and without objection; but when the new hospital buildings were erected on Potrero Avenue, the location of the college became at once most disadvantageous.

The building was not planned with the view of providing for the requirements of advancing medical science, and does not afford the space for anatomical rooms, chemical laboratories, and library. The main lecture halls are ample and are all that could be desired, but it becomes each year more evident that lecture halls do not supply the want of properly equipped laboratories.

The cost of repairs is increasing yearly, and the tuition fees scarcely enable the Faculty to keep the building in good condition.

The disadvantages under which the Medical Department is laboring have had the effect of materially reducing the number of matriculants for the present session, and it is to be feared that the class will be less each year unless this serious drawback to the prosperity of the institution be soon removed.

The degree of M.D. was conferred upon the following graduates by the Board of Regents, November, 1885:

Howell V. Armistead	Modesto, California.
Robert O. Baldwin	Danville, California.
Addison C. Collins	Davisville, California.
John Gallwey	San Francisco, California.
Katherine I. Howard	San Francisco, California.
Daniel D. Lustig, Ph.G.	San Francisco, California.
Theodore A. Nichols	Mission San José, California.
Edward L. Perrault	San Francisco, California.
Wilber J. Wilcox	Oakland, California.
John M. Williamson	Vallejo, California.
Henry N. Winton	Haywards, California.
W. E. Josephine Woods	San Francisco, California.
David Wooster	San Francisco, California.

Respectfully submitted.

R. A. McLean, Dean.

Report of the Dean of the College of Dentistry.

San Francisco, August 2, 1886.

Professor E. S. Holden, *President University of California:*

Dear Sir: Your favor of July twenty-third, asking a report of the College of Dentistry, is at hand. I am only able to make an informal one.

The Dental Department was organized in 1882, its first course of lectures beginning the first Tuesday in April of that year. Since that time the number of students has steadily increased, and the requirements raised so that the standard is second to none in the country.

This college was the second one to adopt a nine months' term, and the third to adopt a preliminary examination. There are twenty-one Dental Colleges in the United States, most of which have a regular session of only five months in each year. Since the first of January, 1886, no students have been allowed to enter except for three years' study, one year of which is allowed in a private office, or in a special course at Berkeley.

During the present session we have, owing to the resignation of Professor Dunbar, been without a Professor of Dental Pathology and Therapeutics. By the kindness of Professor Terrill our students have been allowed to attend his lectures in the Medical Department on general Therapeutics, and we are promised special lectures on Dental Pathology by Professor Dennis.

The Senior Class this session numbers twelve, as follows: H. P. Carlton, H. L. Couret, M. J. Dunn, N. A. Givovich, A. Gore, M.D., J. G. Humphrey, T. H. Morris, W. C. Reith, J. E. Sand, B. F. Simmons, W. O. Stuttmeister, and W. Sylvester.

The number of new students entered this session is twenty, as follows: C. E. Post, G. W. Rodolph, H. M. Jones, J. D. Hodgen, J. T. Rowand, C. F. Rose, E. Meldonado, A. T. Regensburger, F. J. Lane, Miss J. M. Simpson, E. L. Davis, G. F. Rodden, G. E. Shuey, R. E. Payne, N. P. Dennis, H. C. Wilson, E. J. Chacheré, B.S., J. M. Peel, O. F. Westphal, and J. M. Fox.

The wants of the college may be summed up in two words, *room* and *money*. The rooms kindly furnished by the Medical Department are good, but too small for the present number of students, and will prove an impediment in the future.

It is hoped that some action will be taken by the State, in combination with private effort, to supply quarters that will provide for our future students with true California generosity.

In the East, Dental Departments of State Universities are supported by State educational funds. In our own college there has been but one dividend in four years, and that a small one, although the Professors and Instructors have been as faithful as possible in the performance of their duties. It is to be regretted that their time is limited, because they have to depend on private practice for their support. If salaries, even small, were provided by the State, the Professors and Instructors could devote more time to instruction and original research.

The tuition from students serves to pay the running expenses of the college, but little more.

A good beginning has been made in forming a Museum, but want of room prevents a proper display.

The college has been well equipped for the present number of students; the supply of chairs, desks, benches, burring engines, laboratory appliances, etc., has been nearly all furnished by students' fees, but a greater supply will soon be needed.

Very respectfully,

C. L. GODDARD, Dean.

REPORT OF THE DEAN OF THE CALIFORNIA COLLEGE OF PHARMACY.

DEPARTMENT OF PHARMACY, UNIVERSITY OF CALIFORNIA,
SAN FRANCISCO, July 31, 1886.

President EDWARD S. HOLDEN, *University of California:*

MY DEAR SIR: I have the honor and pleasure to report to you the following, regarding the Department of Pharmacy, of the University of California:

We are now in the midst of our lecture session, with an attendance of students larger in numbers than of any previous year. As this attendance is entirely voluntary, we think it is a favorable indication of the progress of pharmaceutical education, and also that the impression with the general public is, that young men should acquire a theoretical and practical knowledge of medicines in order to prepare and dispense them properly.

The condition of our college in regard to the administration of its affairs, the relations between the Board of Trustees and the several Professors, is, I am pleased to state, in perfect harmony and accord.

In regard to the "wants of our College of Pharmacy," I would briefly state that we have no Chemical or Pharmaceutical Laboratory. Ours is the only one in this country that is without this important department. It is absolutely necessary that we should have a laboratory, and it is our earnest desire to have some beginning in this direction.

We would also respectfully solicit your aid and influence with the honorable Governor of this State in behalf of some legal restriction in the practice of pharmacy in this State, and beg leave to call to your notice the fact that in most of the Eastern States laws governing pharmacy are in vogue.

In the coming Legislature should a pharmacy law be drafted and placed before that body, we sincerely trust it will meet with your approval and aid so far as possible.

I am, dear sir, very truly your obedient servant,

EDWARD W. RUNYON, Dean.

APPENDICES.

APPENDIX A.

ACADEMIC HISTORY OF EACH MEMBER OF THE TEACHING FORCE OF THE UNIVERSITY OF CALIFORNIA, OCTOBER 1, 1886, AND OF SOME OF THE EX-MEMBERS.

The following circular was sent to each member of the Academic Senate, in the early part of 1886, and to all ex-members whose addresses were known. The replies received are given in alphabetical order:

UNIVERSITY OF CALIFORNIA,
BERKELEY, March 12, 1886.

DEAR SIR: We earnestly desire to compile a complete bibliography of all the published writings of all the Professors and Instructors of this University, with a view to publication in the future.

Will you at your early convenience kindly prepare a list of all your published works, chronologically arranged?

A compartment in the University Library has been set apart for the accommodation of all writings of members of the Academic Senate, and you are asked to furnish the Library with copies of as many of your past writings as you may now be able to furnish, and with a copy of each of your future publications.

Will you also please to fill out the blank form on the opposite page?

Be good enough to return this sheet so filled out to the Recorder of the Faculties, Berkeley, California,

And believe me, very faithfully yours,

EDWARD S. HOLDEN.

Name in full, ——. Birthplace, ——. Date of birth, ——. Name of college where you graduated, ——. Date of graduation, ——. Degree taken, ——. Higher degrees taken or conferred (as below): Degree of ——, conferred by ——, in the year 18—. Degree of ——, conferred by ——, in the year 18—. Degree of ——, conferred by ——, in the year 18—. Other academic or literary honors conferred upon you, with the dates, ——. Names of the learned societies of which you are a member, ——. List of your writings, chronologically arranged, ——.

NOTE.—The names printed in italics in the following list are those of ex-members of the Academic Senate. Only such of the ex-members as sent replies are here noted.

ARTHUR HUNTINGTON ALLEN. Instructor in Latin and Ancient History, 1873-4. Born, New York City, 20 October, 1851. A.B., Yale, 1873.

WINSLOW ANDERSON. Assistant to the Chair of Materia Medica and Medical Chemistry, 1884. Born, Boston, Mass., 26 May, 1860. Graduate of B. Y. Academy, Provo, Utah, 1881. M.D., University of California, 1884.
Member of County Medical Society, San Francisco.
Member of State Medical Society, California.
Member of California Pharmaceutical Society and College of Pharmacy.
Member of Alumni Association, Medical department University of California.

WILLIAM DALLAM ARMES. Assistant in English, 1884-6. Born, San Francisco, 3 August, 1860. Ph.B., University of California, 1882.

WILLIAM ASHBURNER. Professor of Mining, 1874-6. Honorary Professor of Mining, 1876. Born, Stockbridge, Massachusetts, 28 March, 1831. Student at Lawrence Scientific School, Cambridge, and at Ecole des Mines, Paris.
Fellow of Am. Ass. for Advancement of Science.
Member of Am. Institute of Mining Engineers.
Member of Am. Metrological Society.
Member of Archæological Institute of America.
Member of California Academy of Sciences.

WASHINGTON AYER. Professor of Hygiene, 1885. Born, Haverhill, Massachusetts, 18 June, 1823. M.D., Harvard Medical School, 1847.

President of the Medical Society, State of California, 1872.

President of the San Francisco County Medical Society, 1878.

President of the San Francisco Medical Benevolent Society, 1881–2.

List of writings:

Report on Practical Medicine, 1881.

Relations of Sewer Gas to Disease, 1883.

Transitory Mania with its Medico-Legal Bearing, 1885.

Epic and Pastoral Poems, and a contribution to The Poets of the Pacific, published by May Wentworth, 1867.

GEORGE F. BECKER. Lecturer on Metallurgy, 1874–6. Instructor in Mining and Metallurgy, 1876–9. Born in New York City 5 January, 1847. A.B. Harvard, 1868. Ph.D. Heidelberg, 1869.

Geprüfter Zögling der Königlichen Berg-Academie, Berlin, 1871. U. S. Geologist-in-charge, 1879. Special Agent 10th Census, 1880. Special Agent in charge of the investigation of the precious metal industries of the United States, 1882.

List of writings:

Metallurgical Science.—*Bulletin University of California*, No. 7, 1875.

Popular Lectures on Metallurgy.—*Mining and Scientific Press*, 1875.

Education: Its relations to the State and to the Individual.—*Bulletin University of California*, No. 28, 1877; 72 pages.

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A summary of the Geology of the Comstock Lode, etc.—Annual Report Director U. S. Geological Survey, 1880–81, pp. 293–330.

Relations of Temperature to Glaciation.—*American Journal of Science*, vol. 26, 1883, pp. 167–176.

Geology of the Comstock Lode and the Washoe District.—Monograph U. S. Geological Survey, No. 3, 1882; 422 pages, with atlas of 21 sheets.

Relations of the Mineral Belts of the Pacific Slope to the Great Upheavals.—*American Journal of Science*, vol. 28, 1884, pp. 208–212.

Influence of Convection on Glaciation.—*American Journal of Science*, vol. 27, 1884, pp. 473–476.

Impact, Friction, and Faulting.—*American Journal of Science*, vol. 30, 1885; 29 pages.

Geometrical Form of Volcanic Cones, etc.—*American Journal of Science*, vol. 30, 1885, pp. 283–293.

Statistics and Technology of the Precious Metals.—Tenth Census of the United States, vol. 13, 1885; 541 pages. [By S. F. Emmons and G. F. Becker.]

Notes on the Stratigraphy of California.—Bulletin U. S. Geological Survey, No. 49, 1885; 28 pages.

A Theorem of Maximum Dissipativity.—*American Journal of Science*, vol. 31, 1886, pp. 115–120.

A New Law of Thermo-Chemistry.—*American Journal of Science*, vol. 31, 1886, pp. 120–125.

HANS HERMAN BEHR. Professor of Botany in the College of Pharmacy, 1881. Born, Coethen, 18 August, 1818. M.D., Friedrich Wilhelm University at Berlin, 1843.

List of writings:

Dissertatio Inauguralis de Helminthiasi, 1843.

Ueber die Verhältnisse der Suedaustralischen Flora, 1847.

Loranthaceæ, Droseraceæ, Violarieæ und Diosmeæ von Suedaustralien, 1847.

Description of a Native Silkworm (Saturnia Ceanothi), 1855.

On Californian Argynnides, 1862.

Notes on Californian Satyrides, 1863.

On Californian Lepidoptera, 1867.

Description of a new genus of the Pierides, 1869.

Synopsis Noctuidarum hucusque in California repertarum, 1870.

Changes that have Occurred in the Vegetation of the Peninsula of San Francisco during the last thirty years, 1881.

On Insecticides, 1881.

On the Habits and Economy of some species of Sphingidae, 1882.

Synopsis of the Vascular Plants in the vicinity of San Francisco, 1884.

Biological Synopsis of Californian Lepidoptera, 1885.

New Lepidoptera, 1885.

Linnaean Key to the Local Flora of the vicinity of San Francisco, 1886.

CORNELIUS BEACH BRADLEY. Instructor in English, 1882–6. Assistant Professor of the English Language and Literature, 1886. Born, Bangkok, Siam, 18 November, 1843. A.B., Oberlin College, 1868. Graduate of Yale Divinity School, 1871. A.M., Oberlin College, 1886.

Member of Berkeley Club, Oakland, California.

Published writings:

A New Study of some Problems Relating to the Giant Trees, March, 1886.

Classification of the Figures of Speech, November, 1886.

GEORGE WOODBURY BUNNELL, A.M. Assistant Professor of Latin and Greek, 1872–5. Professor of the Greek Language and Literature, 1875.

No reply received.

CORNELIUS FITZGERALD BUCKLEY. Professor of Anatomy, 1870–71. Medical Examiner, 1871–2. Born, Ireland, 1 March, 1843. Licentiate, Colleges of Physicians and Surgeons, Edinburgh, 1884. A.B., Queen's University, Dublin, 1885. M.D., Queen's University, Dublin, 1885.

List of writings:

Medical papers in *Pacific Medical Journal*, 1870–75.

Cerebral Hyperæmia: Does it Exist? New York: Putnam's Sons, 1882.

SAMUEL BENEDICT CHRISTY. Instructor in Chemistry, 1875–9. Instructor in Mining and Metallurgy, 1879–1885. Professor of Mining and Metallurgy, 1885. Born, San Francisco, 8 August, 1853. Ph.B., University of California, 1874.

Member of California Academy of Sciences, San Francisco; American Institute of Mining Engineers, New York.

List of writings:

Monte Diablo Coals. Cal. Acad. Sciences.

Ocean Placers of San Francisco. Cal. Acad. Sciences, 1878.—*Mining and Scientific Press*, 1878. Locke—*Gold; Its Occurrence and Extraction:* p. 151. London, 1882.

Genesis of Cinnabar Deposits.—*Eng. and Mining Journal*, N. Y.; Cal. Acad. Sciences, 1878; *Am. Journal Sciences*, Vol. XVII, p. 453.

Translation, from *Annales des Mines*, of The Mines and Works of Almaden (Spain).—*Mining and Scientific Press.* Published separately by Dewey & Co., S. F., 1879.

Numerous editorial articles in *Mining and Scientific Press* during 1878 and 1879, such as: Oakland Harbor Improvements; Lowe Water-Gas; South Pacific Coast Railroad; etc.

Expert Testimony before U. S. Circuit Court—Knox & Osborne *vs.* Quicksilver Mining Co. Testimony, Vol. I, p. 143. 1880.

Translation of Austrian Government Report—Imperial Quicksilver Mines and Works of Idria (Austria). Published by J. B. Randol, Esq., S. F., 1884.

Miners' Fund of New Almaden.—Transactions American Institute Mining Engineers, Vol. XIII, p. 181. 1884; also, London *Engineering.*

Quicksilver Reduction at New Almaden.—Transactions American Institute of Mining Engineers, Vol. XIII, p. 547. 1884; Mineral Resources of U. S., 1883–4, U. S. Geological Survey; Proceedings Institution of Civil Engineers (London), Vol. LXXXI, p. 79; *Engineering and Mining Journal* (N. Y.); *Mining and Scientific Press* (S. F.).

Quicksilver Condensation at New Almaden.—Transactions American Institute of Min. Eng., Vol. XIV, p. —.

Numerous Book Notices and Reviews.

JOHN BERNARD CLARKE, Ph.B. (University of California.) Assistant in Mathematics, 1876–7. Instructor in Mathematics, 1877–1881. Assistant Instructor in Mathematics, 1881–3. Instructor in Mathematics, 1883–5. Assistant Professor of Mathematics, 1885.

List of writings:

Algebra, 1879.

Elementary Algebra, 1880.

Importance of Assertion and Maintenance of State Rights, 1883.

Higher Education in California, 1885.

GEORGE ELDEN COLBY. Second Assistant in the Viticultural Laboratory, 1885. Born, Claremont, California, 11 November, 1860. Ph.B., University of California, 1880.

List of writings:

Analysis of the Ash of Two California Wheats.—Appendix No. 7, Report of College of Agriculture, 1880, University of California.

R. BEVERLY COLE, A.M., M.D., M.R.C.S., England. Professor of Obstetrics and Gynecology, 1877.

No reply received.

ALBERT STANBURROUGH COOK. Professor of the English Language and Literature, 1882–. Born, Montville, N. J., 6 March, 1853. B.S., Rutgers College, N. J., 1872. M.S., Rutgers College, 1875. M.A., Rutgers College, 1882. Ph.D., University of Jena, 1882.

Member of:

American Philological Association.

Modern Language Association of America.

American Society for Psychical Research.

List of writings:

Studies in the Heliand—Transactions of the Amer. Phil. Assoc. for 1879, pp. 60–75.

Extracts from the Anglo-Saxon Laws. New York, Henry Holt & Co., 1880.

The Word *Weasand.*—*Amer. Jour. Phil.*, I, 61-64 (1880).

Review of Skeat's Etymological Dictionary of the English Language.—*Amer. Jour. Phil.*, I, 203-206.

The Philological Society's English Dictionary.—*Amer. Jour. Phil.*, II, 550-554.

Review of Sievers' Angelsächsische Grammatik.—*Amer. Jour. Phil.*, IV, 224-8.

Vowel-Length in King Alfred's Orosius.—*Amer. Jour. Phil.*, V, 318-324.

[Reprint of Lewes' Principles of Success in Literature. March, 1885. Added for formal completeness, but hardly to be included.]

An Old English Grammar, by Eduard Sievers, Ph.D., Professor of Germanic Philology in the University of Tübingen. Translated and Edited.

Fine Art in Romantic Literature.—*Overland* for July, 1885.

Vowel-Length in Old English I.—*Amer. Jour. Phil.*, VI, 296-309.

A Latin Poetical Idiom in Old English.—*Amer. Jour. Phil.*, VI, 476-479.

Native and Foreign Words in De Quincey.—*Mod. Lang. Notes* I, 30-31.

A High School Reference Library for English.—*California Teacher* for March, 1886.

Reports on Kölbing's Englische Studien.—*Amer. Jour. Phil.*, I (1880), 225-229; II (1881), 110-115, 545-550; IV (1883), 503-507; V (1884), 126-129; VI (1885), 512-514.

GEORGE DAVIDSON, A.M., Ph.D. Professor of Geodesy and Astronomy, 1872-5. Nonresident Professor of Geodesy and Astronomy, 1875-6. Honorary Professor of Geodesy and Astronomy, 1876.

No reply received.

WILLIAM WHITE DEAMER. Instructor in Latin, and Recorder, 1883-6. Instructor in Latin and Greek, 1886. Born, Oroville, California, 25 November, 1860. A. B., University of California, 1883.

Member of California Historical Society.

S. W. DENNIS, M.D., D.D.S. Professor of Operative Dentistry and Dental Histology, 1881.

No reply received.

JAMES P. H. DUNN, B.S. Assistant in Chemistry, 1884. Born, Oakland, California, 11 June, 1860. B.S., University of California, 1884. Member of Berkeley Scientific Club.

CHARLES HASCALL DWINELLE. Lecturer on Practical Agriculture, 1878-1885. Born, Rochester, New York, 28 March, 1847. Ph.B., Sheffield Scientific School of Yale College, 1871.

Prize for excellence in French, Sheffield, 1871; honorable mention for excellence and collection in Botany, Sheffield, 1871.

Partial list of published writings:

1. Contributions to *Pacific Rural Press* from 1871 to 1886, on various topics of agricultural interest, as: Forage Plants for Dry Climates; Liver Rot in Sheep; Remedies for Choking Cattle; Agriculture as a Science; The Corn Cockle; The Currant Borer; Spraying Fruit Trees; Bee Pasture, etc.
2. In the *California Patron :* Forage Grasses, an address before Walnut Creek Grange.
3. In the *Russian River Flag :* The Vine Hopper; The Army Worm.
4. Forage, a contribution to the Report of the California State Board of Agriculture, 1877.
5. As President of the State Board of Horticultural Commissioners: Addresses at First and Second Fruit Growers' Conventions, published in proceedings; articles in Annual Report of Board upon the woolly aphis, etc.
6. Addresses at Third and Fourth Conventions of Fruit Growers in favor of endowing a Chair of Entomology.
7. Entomology in the College of Agriculture, being Bulletin No. 16, September 11, 1884.
8. Entomological Quarantine, in Proceedings of the Society for the Promotion of Agricultural Science, 1st volume.
9. Contributions to the Reports of the College of Agriculture, University of California, upon Field Experiments, Insecticides, etc.
10. Editorials in *The Cultivator's Guide* during the year of its existence—a semi-monthly published at Sacramento. (See file in University library.)

GEORGE CUNNINGHAM EDWARDS. Instructor in Mathematics and Commandant of University Cadets, 1873-1883. Instructor in Mathematics, 1883-4. Assistant Professor of Mathematics, 1884-. Born, Spencer, Indian Territory, 18 June, 1852. Ph.B., University of California, 1873.

Member of California Academy of Sciences.

STEPHEN J. FIELD, LL.D. Honorary Professor of Law, 1880-6.

No reply received.

MELANCTHON WILLIAMS FISH. Professor of Physiology and Microscopy, 1882-. Born, Kortwright, N. Y., 20 March, 1828. M.D., Rush Medical College, Chicago, Ill., 1854.

DANIEL COIT GILMAN. President University of California, 1872-3. President University of California, and Professor of Political Economy and Social Science, 1873-4. President University of California, 1874-5. Born, Norwich, Conn., 6 July, 1831. A.B., Yale, 1852. A.M., Yale, 1855. LL.D., Harvard, 1876. LL.D., St. Johns College, 1876.

Fellow Amer. Assoc. Adv. Sci.

Fellow Amer. Acad. Arts and Sci.

Fellow Amer. Phil. Soc.

Director Amer. Oriental Soc.
Vice-President Amer. Soc. Sci. Assoc.
Member of Amer. Antiquarian Society, American Historical Society, and of many other societies.
List of writings not returned.

CLARK LAMOTTE GODDARD. Professor of Mechanical Dentistry, 1881–. Born, Beloit, Wis., 26 June, 1849. A.B., Beloit College, 1872; D.D.S., Philadelphia Dental College, 1874; A.M., Beloit College, 1875.
Member of California State Odontological Society.

FREDERICK GRAZER, Ph.G. Corresponding and Recording Secretary, College of Pharmacy, 1881–5. Professor of Materia Medica in the College of Pharmacy, 1885.
No reply received.

EDWARD LEE GREENE. Instructor in Botany, 1885–. Born, Hopkinton, R. I., 20 August, 1843. Ph.B., Albion Academy, Wis., 1866.
Member of:
California Academy of Sciences.
Davenport Academy of Natural Sciences.
Torrey Botanical Club, New York, N. Y.
List of writings:
Rambles of a Botanist in New Mexico, I.—*American Naturalist*, March, 1878.
Rambles of a Botanist in New Mexico, II.—*American Naturalist*, April, 1878.
Notes on Certain Silkweeds.—*Botanical Gazette*, June, 1880.
Botanizing on the Colorado Desert, I.—*American Naturalist*, November, 1880.
Botanizing on the Colorado Desert, II.—*American Naturalist*, January, 1881.
New Plants of New Mexico and Arizona.—*Botanical Gazette*, March, 1881.
New Plants of New Mexico and Arizona.—*Botanical Gazette*, June, 1881.
New Species of Plants from New Mexico.—*Botanical Gazette*, January, 1881.
An Emendation of the Genus Fendlera.—Bulletin of Torrey Club, January, 1881.
New Species of Plants, chiefly New Mexican.—Bulletin of Torrey Club, September, 1881.
New Species of Plants, chiefly New Mexican.—Bulletin of Torrey Club, November, 1881.
New California Compositæ.—Bulletin of Torrey Club, January, 1882.
New Western Plants.—Bulletin of Torrey Club, April, 1882.
New California Compositæ.—Bulletin of Torrey Club, September, 1882.
New Western Plants.—Bulletin of Torrey Club, October, 1882.
On Holozonia filipes.—Bulletin of Torrey Club, December, 1882.
New Western Plants.—Bulletin of Torrey Club, December, 1883.
New Plants.—Bulletin of Torrey Club, April, 1883.
New Western Compositæ.—Bulletin of Torrey Club, August, 1883.
New Plants of Pacific Coast.—Bulletin California Academy of Sciences, I, 1884.
Studies in the Botany of California, I (pp. 62).—Bulletin California Academy of Sciences, III, 1885.
Studies in the Botany of California, II (pp. 50).—Bulletin California Academy of Sciences, IV, 1885.
New Species of the Genus Astragalus.—Bulletin California Academy of Sciences, IV, 1885.
Studies in Botany of California, III (pp. 7.).—Bulletin California Academy of Sciences, IV, 1885.
Studies in Botany of California, IV (pp. 20).—Bulletin California Academy of Sciences, V, March, 1886.
A New Genus of Ranunculaceæ.—Bulletin California Academy of Sciences, V, March, 1886.

AUGUST HARDING. Assistant in Chemistry, 1880–81. Instructor in Chemistry, 1886.
No reply received.

GEORGE F. E. HARRISON, 1st Lieutenant, 2d United States Artillery. Professor of Military Science and Tactics, 1886. Born, California, 8 November, 1851. United States Military Academy, 1873. Diploma from United States Artillery School in 1882, after two years course of study.

SERRANNO CLINTON HASTINGS. Professor of Comparative Jurisprudence, 1879. Born Jefferson County, New York, 22 November, 1814. For six years student at Gouverneur Academy, New York.
Principal Norwich Academy, New York.
Law Student with D. S. Major, Laurensburgh, Indiana, for two years.
Life member of Society of Pioneers of San Francisco.
Life member of Academy of Sciences of San Francisco.
Member of 29th Congress from Iowa.
Chief Justice of Supreme Court of Iowa.
First Chief Justice of Supreme Court of California.
Attorney-General of the State of California.
Founder of the Hastings College of the Law of the University of California, 1878.
Assistant to Professor Whitney and Dr. A. Gray, in the publication of the two volumes of the Botany of the Pacific, taken from the Geological Survey of California.

FREDERICK G. HESSE. Professor of Industrial Mechanics, 1875–1884. Professor of Mechanical Engineering, 1884. Born, Treves, Prussia, 28 March, 1826. Graduated at the Gewerbe Institute, Treves, Prussia, 1845.

List of writings:

1844. Direct Demonstration of a Geometrical Problem in the year 1844. See paper by Professor Sylvester: "On a simple Geometrical Problem, illustrating a conjectured principle in the theory of Geometrical Method."—*Philosophical Magazine for 1852 and 1874.*

1854. Synthetical Treatment of the Gyroscope, with many illustrations and new applications.—Weekly paper, Westchester, Pennsylvania.

1859. Report on the Character of the Daily Change in position of the Observatory, under the influence of the heat of the sun's rays, and on the resulting modification in the correction for Azimuth. United States Naval Astronomical Expedition to the Southern Hemisphere. On file at the United States Naval Observatory at Washington, D. C.

1864. On the Instantaneous Reduction of Ores to Powder by Concussion, and on a system of Automatic Sizing.—*Mining and Scientific Press*, San Francisco, 1864, and Patent No. —, 1864.

1867. On a Continuous Ore Amalgamator with Grinding Action, in combination with a system of Adjustable Currents.—*Mining and Scientific Press*, San Francisco. For synopsis and results see United States Letters Patent, No. 69,564, October 8, 1867.

1867. On the Influence of Great Intensity of Separating Forces on Amalgamation in Overcoming Surface Tension, Adhesion, Viscosity, etc. For synopsis and results see United States Letters Patent, No. 70,839, November 12, 1867.

1871. On the Efficiency of Water Pressure Engines and Pumps, with uniform flow, balanced, and without packing. For synopsis and results see United States Letters Patent, No. 111,060, January 17, 1871.

1875. Discussion on Turbines, with Governor Attachment for Automatic Adjustment, to insure a water supply corresponding to work and consistent with maximum efficiency. See United States Letters Patent for Water Wheel and Hydraulic Governor, No. 161,035, March 23, 1875.

1877. On the Application of a Water Wheel and Governor to a Hydraulic Hoist, to adjust, automatically, water supply to load, without interfering with maximum efficiency. See United States Letters Patent, No. 191,529, June 5, 1877.

1877. Report on Water Meter Tests in use by the Spring Valley Water Company, with special reference to the character of the possible errors. See Report of the Twelfth Industrial Exhibition of the Mechanics' Institute, 1877.

1883. On a new Fluid Pressure Gauge, designed mainly for Laboratory use. See *Mining and Scientific Press*, San Francisco, 1883, and also United States Letters Patent, No. 275,765, April 10, 1883.

1883. On Velocity Meters, and on the required conditions to insure permanency and accuracy. See *Van Nostrand's Engineering Magazine*, vol. 33, July, 1885; also, United States Letters Patent, No. 282,985, August 14, 1883.

EUGENE W. HILGARD, Ph.D. Professor of Agriculture, 1874–5. Professor of Agriculture and Agricultural Chemistry 1875–6. Professor of Agriculture and Agricultural Chemistry, General and Economic Botany, 1876–. Born, Zweibrucken, Palatinate, 5 January, 1833. Ph.D., University of Heidelberg, 1853; LL. D., University of Mississippi, 1884.

Member of:

National Academy of Sciences.
Am. Assn. Adv. Science.
Am. Soc. for the Promotion of Agr. Science.

List of writings:

1. Beitrag fur Kenntniss der Lichtflamme. Inaugural Dissertation; Heidelberg, 1854; 49 pp., 8vo.—*Ann. Chem. and Pharm.*, Vol. XCII, p. 129.
2. On the Quantitative Assay of Chromium by Blowpipe Processes.—In full: Proc. Amer. Ass'n Adv. Sci., Montreal Meeting, 1857; 22 pp.—In abstract: *Am. Jour. Sci.*, Sept. 1857; 8 pp.
3. Report on the Condition of the Geological and Agricultural Survey of the State of Mississippi. Jackson, Miss., 1858; 22 pp.
4. Report on the Geology and Agriculture of the State of Mississippi. Jackson, 1860; 391 pp., and map.
5. On the Quaternary Formations of the State of Mississippi.—*Am. Jour. Sci.*, May, 1866; 15 pp.
6. Remarks on the New Division of the Eocene, or Shell Bluff Group, proposed by Mr. Conrad.—*Am. Jour. Sci.*, July, 1866; 4 pp.
7. Remarks on the Drift of the Western and Southern States, and its Relations to the Glacier and Iceberg Theories.—*Am. Jour. Sci.*, November, 1866; 5 pp.
8. On the Tertiary Formations of Mississippi and Alabama.—*Am. Jour. Sci.*, Jan., 1876; 12 pp.
9. On the Geology of Lower Louisiana and the Rock Salt Deposit of Petite Anse Island.—*Am. Jour. Sci.*, Jan., 1869; 6 pp.
10. On the Condition of our Knowledge of the Processes in Luminous Hydrocarbon Flames.—Proc. Am. Ass'n for the Adv. Sci., Chicago Meeting, 1868; *Am. Jour. Sci.*, vol. 47, No. 140, p. 218; 5 pp.
11. Preliminary Report to the New Orleans Academy of Sciences of a Geological Reconnoissance of Louisiana.—*DeBow's Review*, Sept., 1869; 15 pp.

12. Summary of Results of a late Geological Reconnoissance of Louisiana.—*Am. Jour. Sci.*, Nov., 1869; 16 pp.

13. Report on the Geological Age of the Mississippi Delta.—Rep. U. S. Eng. Dep't for 1870; 16 pp.

14. On the Maintenance of Fertility in Soils.—*Rural Carolinian* for Nov. and Dec., 1870; 12 pp.

15. On the Geology of the Delta and the Mudlumps of the Passes of the Mississippi.—*Am. Jour. Sci.*, Third Series, Vol. I; 34 pp.

16. On the Geological History of the Gulf of Mexico.—Proc. Am. Ass'n Adv. Sci., Indianapolis, 1871; *Am. Jour. Sci.*, Dec., 1871; *Am. Naturalist*, Ass'n Number, 1871.

17. Report on the Organization of the Department of Agriculture and the Mechanic Arts in the University of Mississippi. Oxford, Mississippi, August, 1871; 8 pp.

18. Memoir on the Geology of Louisiana and the Rock Salt Deposit on Petite Anse Island. With plates and diagrams.—Smithsonian Contr. to Knowledge, Vol. —; 34 pp., lge. 4to. (No. 248.)

19. On Some Points in the Geology of the Southwest.—*Am. Jour. Sci.*, October, 1872; 4 pp.

20. On Soil Analyses and their Utility.—*Am. Jour. Sci.*, December, 1872; Proc. Am. Ass'n for Adv. Sci. Dubuque, 1872; 10 pp.

21. On the Silt Analyses of Soils and Clays.—Am. Ass'n Adv. Sci. Portland, 1873; *Am. Jour. Sci.*, October and November, 1873; 9 pp.

22. Silt Analyses of Mississippi Soils and Subsoils.—Proc. Am. Ass'n Adv. Sci., 1873, p. 71; *Am. Jour. Sci.*, January, 1874; 9 pp.

23. Supplementary and final Report of a Geological Reconnoissance of the State of Louisiana. New Orleans, 1873; 44 pp., 8vo.

24. Address on Progressive Agriculture and Industrial Education, delivered at the Mississippi State Fair, November 14, 1873; 31 pp.

25. Note on Lignite Beds and their Underclays.—*Am. Jour. Sci.*, March, 1874; 3 pp.

26. On Mallet's Theory of Vulcanicity.—*Am. Jour. Sci.*, June, 1874; 11 pp.

27. On the Study of Natural Science in the Common Schools.—*Michigan Teacher* for March, 1874; Proc. Mich. Teachers' Ass'n, at Kalamazoo, 1874.

28. Articles on "Artesian Wells," "Vine Culture," "Wines and Wine-making," in Johnson's Universal Cyclopedia, 1875.

29. Lecture on the Phylloxera or Vine Louse, delivered at San Francisco, Nov. 23, 1875.—*University Press*, Berkeley, Cal., 24 pp.

30. Circular concerning an Industrial Survey, Transmission of Soil Specimens, etc.—Bulletin No. 26 of the Univ. of California, Apr. 1877. 6 pp. 8 vo.

31. (First) Report to the President of the University of California, on the work of the Agricultural Department, Dec., 1877. 63 pp., 8 vo.

32. On the Destruction of the Ground Squirrel by the Use of Bisulphid of Carbon.—Bulletin No. 32, Univ. of Cal., April, 1878. 6 pp., 8 vo.

33. On the Flocculation of Particles, and its Physical and Chemical Bearings.—*Am. Jour. Sci.*, Febr., 1879. In translation: Forschungen aus dem Gebiete der Agriculturphysik, 1879. 10 pp., 8 vo.

34. Report on the Borings made between Lake Borgne and the Mississippi River, in 1874, at the Site proposed as an Outlet for Floodwaters.—Report of the U. S. Engineer Department, 1877; publ. 1878. 49 pp., 8vo., with maps and plates.

35. (Second) Biennial Report of the Department of Agriculture of the University of California. Sacramento, 1879. 113 pp., 8vo.

36. The Loess of the Mississippi Valley and the Aeolian Hypothesis.—*Am. Jour. Science*, August, 1879; 8 pp., 8vo.

37. The Agriculture and Soils of California.—Report of the U. S. Department of Agriculture for 1878; 30 pp., 8vo.

38. Physical Geography of the State of Mississippi. Cincinnati, 1880; 10 pp., 4to., and Maps, in Eclectic Series, Van Antwerp, Bragg & Co.

39. Lecture on "The Permanent Maintenance of our Vineyards." Delivered at St. Helena, December 18, 1880; publ. First Report of the State Viticultural Commission of California, p. 57, 6 pp.

40. (Third) Report of the Department of Agriculture of the University of California. 42 pp., 8vo. Sacramento, 1881.

41. The Later Tertiary of the Gulf of Mexico.—*Am. Jour. Sci.*, July, 1881; 8 pp., 8vo., with colored Geol. Map.

42. The Objects and Interpretation of Soil Analysis.—*Am. Jour. Sci.*, September, 1881; 15 pp., 8vo.

43. Progress in Agriculture by Education and Government Aid.—*Atlantic Monthly* for April and May, 1882; 22 pp.

44. Report on the Climatic and Agricultural Features and the Agricultural Practice and Needs of the Arid Regions of the Pacific Slope. Made under the direction of the Commissioners of Agriculture, by E. W. Hilgard, J. C. Jones, and R. W. Furnas, Commissioners. Washington, 1882; 182 pp.

45. (Fourth) Report of the Department of Agriculture of the University of California. Sacramento, 1882; 179 pp.

46. Einige Bemerkungen ueber die Schlaemmanalyse.—Wollny's Forschungen auf dem Gebiete der Agricultur Physik, vol. 6, p. 52, 4 pp.

47. Report on the Cotton Production of the United States, according to the Tenth Census. 2 vols., 4to, embracing, as personal work, apart from editorial:

(*a.*) Report on the Cotton Production and Agricultural Features of the State of Louisiana. 100 pp., 4to, with two colored maps.

(*b.*) Report, etc., of the State of Mississippi. 120 pp., 4to, with two colored maps.

(*c.*) Report, etc., of the State of California. 131 pp., with two colored maps.

(*d.*) General Discussion of the Results of the Tenth Census, as regards Cotton Production in the United States. 69 pp., 4to.

48. Report of Professors E. W. Hilgard and F. V. Hopkins, upon the Examination of Specimens from Borings on the Mississippi River, between Memphis and Vicksburg. Rep. Mississippi River Commission for 1883, p. 479, 19 pp., 8vo.

49. The Salines of Louisiana.—U. S. Geological Survey Report on the Mineral Resources of the United States, 1883; p. 554; 12 pp.

50. The Asphaltum Deposits of California.—U. S. Geological Survey Report on the Mineral Resources of the United States, 1884; 10 pp.

51. (Fifth) Report of the College of Agriculture of the University of California. Sacramento, 1884; 111 pp.

52. Report on the Agricultural Features of Eastern Washington Territory, made under the auspices of the Northern Transcontinental Survey. Yakima, Colville, Spokane, and Vermillon River Regions.—*The Northwest*, St. Paul, 1884.

53. Ueber die Bedeutung der hygroscopischen Bodenfenchtigkeit fuer die Vegetation. Wollny's Forschungen auf dem Gebiete der Agriculturphysik, Vol. 8; p. 93, 1885; 7 pp.

54. The Old Tertiary of the Southwest.—*Am. Jour. Sci.*, Vol. XXX, October, 1885; p. 266; 4 pp.

55. On Some Redeeming Features of Alkali Soils.—Proc. Am. Soc. for the Prom. of Agr. Science for 1885; 4 pp.

56. Report of Viticultural Work during the Seasons 1883–4, and 1884–5, with notes on the Vintage of 1885–6. Appendix to the Report of the College of Agriculture of the University of California, for 1884. Sacramento, 1886; 210 pp., 8 vo.

(*In press.*)

57. Historical Outline of the Geological Survey of the State of Mississippi. In Publications of the U. S. Geological Survey for 1886. About 13 pp., 8 vo.

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62. (Sixth) Report on the Experimental Work of the College of Agriculture of the University of California. Sacramento, 1886. About 150 pp.

Besides the above, Professor Hilgard has published numerous minor articles in transient publications.

EDWARD SINGLETON HOLDEN, President of the University of California, and Director of the Lick Observatory, 1885. Born Saint Louis, 5 November, 1846. B.S., Washington University, Saint Louis, 1866. Graduate U.S. Military Academy, West Point, 1870. A.M., Washington University, 1878. LL.D, University of Wisconsin, 1886. 2d Lieut. 4th U. S. Artillery, 1870. 2d Lieut. U. S. Corps Engineers, 1871. Professor of Mathematics, U. S. Navy, 1873. Professor of Astronomy, and Director Washburn Observatory in the University of Wisconsin, 1881. President of the University of California, and Director of the Lick Observatory, 1885.

Member of:

Philosophical Society of Washington.
Astronomische Gesellschaft of Germany.
California Historical Society.
Wisconsin Academy of Sciences.
California Academy of Sciences.
National Academy of Sciences.
Corresponding Member Academy of Sciences (St. Louis).
Fellow American Association for the Advancement of Science.
Associate Fellow American Academy of Arts and Sciences (Boston).
Foreign Associate Royal Astronomical Society (London).

List of writings:

1. The Bastion System of Fortification, its Defects, and their Remedies, N. Y., 1872, 8vo.

2. On a New Arrangement of Shutters for a Dome for an Equatorial Telescope.—*Am. Jour. Sc.*, 3 s., 6: 375–377 (Nov., 1873).

3. On the Adopted Value of the Sun's Apparent Diameter.—Bull. Phil. Soc. Wash. 1 (App. 1): 3–9 (Jan., 1874).

4. On Sir William Herschel's Observations of the Satellites of Uranus.—Bull. Phil. Soc. Wash. (App. 4): 30–36 (June, 1874).

5. Telescopic Research on the Nebula of Orion. (Illustrated.)—*Pop. Sc. Month.*, 5: 257–268 (July, 1874).

6. On the Inner Satellites of Uranus.—Proc. Am. Ass., 23: 49–56 (Aug., 1874); Month. Not. Roy. Astron. Soc., 35: 16–22 (Nov., 1874).

7. On the Possible Periodic Changes of the Sun's Apparent Diameter [by Newcomb and Holden].—*Am. Jour. Sc.*, 3 s., 8: 268–277 (Oct., 1874).
8. On the Number of Words used in Speaking and Writing.—Bull. Phil. Soc. Wash. 2 (App. 6): 16–21 (Jan., 1875).
9. Drawing of the Ring Nebula in Lyra.—Month. Not. Roy. Astron. Soc., 36: 61–69 (Dec., 1875).
10. [Progress of Astronomy in 1876.]—Ann. Rec. Sc. and Indust., 1876, pp. 17–26.

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11. Report upon the Astronomical Instruments of the Loan Collection of Scientific Instruments at the South Kensington Museum, 1876.—Rep. Sec. Navy, 1876, pp. 289–314.
12. The Horseshoe Nebula in Sagittarius. (Illustrated.)—*Pop. Sc. Month.*, 8; 269–281 (Jan., 1876).
13. On Supposed Changes in the Nebula M. 17.—*Am. Jour. Sc.*, 3 s., 11: 341–361 (May, 1876).
14. Comparison of the Washington Observations of the Satellite of Neptune with Newcomb's tables.—*Astron. Nachr.*, 88: 183–188 (July, 1876).
15. On Reference Catalogues of Astronomical Papers and Memoirs.—*Bull. Phil. Soc. Wash.*, 2: 95–101 (Dec., 1876).
16. Index-Catalogue of Books and Memoirs relating to Nebulæ and Clusters, etc. Washington, 1877, 9 + 109 + [2] p. 8°.—(*Smithsonian Misc. Coll.*, vol. 14).
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18. [Observations of Comets *a. b, c*, 1877.]—*Astron. Nachr.*, 90: 167, 170, 331 (1877).
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20. Index-Catalogue of Books and Memoirs on the Transits of Mercury. Cambridge, 1878. 6 pp., 8°. (Lib. Harv. Univ. Bibliog. Contrib., No. 1.)
21. Note on the Reticulated Forms of the Sun's Surface.—*Am. Jour. Sc.*, 3 s., 16: 346 (Nov., 1878).
22. A Subject-Index for the Publications of Observatories.—*Library Jour.*, 3: 365 (Dec., 1878).
23. Catalogue of the Library of the United States Naval Observatory. Part I, Astronomical Bibliography. Washington, 1879. 10 pp. 4°.
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27. Astronomy for Students and General Readers [by Newcomb and Holden]. (Illustrated.) 2d ed. New York, 1880. 11 + 512 pp. 8°.
28. Note on a Relation between the Colors and Magnitudes of the Components of Binary Stars.—*Am. Jour. Sc.*, 3 s., 19: 467–472 (June, 1880.)
29. On the Treatment of Pamphlets in Special Libraries. (Illustrated.)—*Library Jour.*, 5: 166 (June, 1880).
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41. Publications of the Washburn Observatory of the University of Wisconsin. Vols. i, ii, iii, iv. Madison, 1882–'86. 4 vols. 8°.
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53. The Narrow Belt on Saturn. (Illustrated.)—*Observatory*, 7: 74 (Mar., 1884).

54. Statistics of Stellar Distribution derived from Star Gauges and from the Celestial Charts of Peters, Watson, Chacornac, and Palisa.—*Observatory*, 7: 249-256 (Sept., 1884).

55. The Lick Observatory.—*Sid. Mess.*, 3: 301–303 (Dec., 1884). See, also, *Overland Mon.* 1. *s.*, 6: 651–655 (Dec., 1885).

56. Sketch of Professor S. P. Langley.—*Pop. Sc. Month.*, 27: 401–409 (July, 1885).

57. Inaugural Address of President Holden, June 30, 1886. Sacramento, California, 1886.

58. Photography, the Servant of Astronomy.—*Overland Monthly*, November, 1886.

59. Publications of the Lick Observatory, Vol. I. Sacramento, 1886, 4°. (In press.)

GEORGE HOLMES HOWISON. Mills' Professor of Intellectual and Moral Philosophy, and Civil Polity, 1884. Born, Montgomery County, Md., 29 November, 1834. A.B., Marietta College, 1852. M.A. (Honoris Causa), Marietta College, 1855. LL.D., Marietta College, 1883.

List of writings:

1861. The Principles of Primary Teaching. In *Ohio Journal of Education.*

1866. The Religiousness of Speculative Culture. In *The Radical*, Boston.

1867. The Rational Completeness of the Christian Religion: a Review of Seeley's *Ecce Homo.* In *The Radical*, Boston.

The Temptation of Christ: Second article in review of *Ecce Homo.* In *The Radical*, Boston.

1869. A Treatise on Analytic Geometry, especially as applied to the Properties of Conics: including the Modern Methods of Abridged Notation. 12mo. Cincinnati: Van Antwerp, Bragg & Co.

1871. The Departments of Mathematics and their Mutual Relations. In the *Journal of Speculative Philosophy*, vol. V, No. 2.

A Primer of Algebra: designed to supplement the Treatise of Mr. Sherwin. 16mo., paper. Cambridge: The Riverside Press, H. O. Houghton & Co.

1877. An Account of the Department of Philosophy in the Massachusetts Institute of Technology. 8 vo., paper. Boston: Lockwood, Brooks & Co.

1882. Two Lectures on Recent Aspects of Philosophy in Germany. In *Concord Lectures.* Imp. 8vo. Cambridge: Moses King.

1883. Some Aspects of Recent German Philosophy. (Exposition and Criticism of the Systems of Schopenhauer, Hartmann, Dühring, and Lange.) In the *Journal of Speculative Philosophy*, vol. XVII, No. 1.

1884. Hume and Kant: Outline of Four Lectures at the Concord School of Philosophy in 1883. 12mo. Berkeley: At the University Press.

Umriss von Vier Vorträgen über Hume und Kant, gehalten im Juli, 1883, am philosophischen Institut zu Concord, Mass. 8vo. San Francisco: Druck von Rosenthal und Roesch.

Dasselbe. Zweiter vermehrter und veränderter Abdruck. 8vo. Ebendaselbst.

1885. Hume and Kant. Translation of the last preceding into English. In the *Journal of Speculative Philosophy*, vol. XIX, No. 1.

The Essential Principle of Poetic Art. In the *Overland Monthly* for May.

Elective Studies and National Culture. In *The University*, Chicago, for 26 Sept.

Electives and our National Rank in Education. In *The University*, Chicago, for 24 Oct.

Elective Studies and the Civil Spirit. In *The University*, Chicago, for 21 Nov.

Is Modern Science Pantheistic? In the *Overland Monthly* for Dec.; reprinted, with additions, in the *Journal of Speculative Philosophy*, vol. XIX, No. 4.

1886. The "Unification" of our Educational System. In *The University* for 27 Feb.

The Harvard "New Education." (Review of Prof. G. H. Palmer.) In *Andover Review* for June.

JAMES ALEXANDER HUTTON. Professor of Military Science and Tactics, 1883–6. Born, Yolo, Cal., 10 January, 1853. Graduate of U. S. Military Academy, West Point, 1876.

A. WENDELL JACKSON, Jr., Ph.B. Instructor in Mineralogy, 1876–1881. In Mineralogy, Petrography, and Economic Geology, 1881–6. June 1, 1886, a separate department of Mineralogy, Petrography, and Economic Geology was created, and Mr. Jackson was appointed to be Professor of Mineralogy, Petrography, and Economic Geology in the University of California, to date from July 1, 1886. Born, Chelsea, Mass., 13 February,

1855. Ph.B., University of California, 1874. Spent the Summer semester of 1875 at the University of Leipzig, and the Winter semester of 1875 and Summer semester of 1876 at the Freiberg Mining School, Saxony.

Member of:

California Academy of Sciences; Deutsche Geologische Gesellschaft.

List of writings:

On the Occurrence of Glaucophane in California Rocks. Read before California Academy of Sciences (unpublished) 187–.

On the Study of Rock-Genesis. Published in *Science Record* (a scientific supplement of the *Mining and Scientific Press*, S. F.), vol. II, p. 4, Jan., 1880.

On the Use of the Microscope in Geology. Lecture before California Academy of Sciences, Nov., 1878.—*Science Record*, vol. II, p. 20, March, 1880.

On the Occurrence of Silver in Sedimentary Rocks. Read before Academy of Sciences (Cal.).—*Mining and Scientific Press*, vol. XLII, p. —, Feb. 19, 1881. *Mining and Scientific Press*, vol. XLII, p. 242, April 16, 1881. Republished in the annual report of the Director of United States Mint: On the production of the precious metals in the United States for the year 1881, p. 384. Executive Document No. 99, presented to the House of Representatives at the third session of the Forty-sixth Congress, 1880–81. Republished also in *Scientific American*, vol. XI, No. 278, p. 4,428, April 30, 1881.

On Minerals. Lecture before Mechanics' Institute of San Francisco, winter of 1881–82. Published in *Mining and Scientific Press*, vol. XLIV, p. 144, March ,1882; *Mining and Scientific Press*, vol. XLIV p. 160; *Mining and Scientific Press*, vol. XLIV, p. 176; *Mining and Scientific Press*, vol. XLIV, p. 230.

On Rocks. Lecture before Mechanics' Institute, San Francisco, Winter of 1881–82. Published in *Mining and Scientific Press*, vol. XLV, p. 38, July, 1882; *Mining and Scientific Press*, vol. XLV, p. 54.

On the General Principles of the Nomenclature of the Massive Crystalline Rocks. Read before the California Academy of Sciences. Published in *American Journal of Sciences*, third series, vol. XXIV, No. 140, August, 1882.

On the Structure and Genesis of the Bassick Ore Deposit, Colorado. Read before California Academy of Sciences. Published in *Mining and Scientific Press*, vol. XLVII, p. 226, October, 1883.

On Colemanite, a New Borate of Lime.—*American Journal of Sciences*, 1884, vol. XXVIII, p. 447.

On the Morphology of Colemanite.—*Bulletin of the California Academy of Sciences*, 1885, No. 2, p. 3.

Mineralogical Contributions—Colemanite, Pyrite, Albite, Vivianite, and Azurite.—*Bulletin of the California Academy of Sciences*, No. —, 1886.

HENRY BENJAMIN JONES. Assistant Instructor in German, 1875–6. Assistant Instructor in French and German, 1876–1881. Instructor in French, 1881–6. Born New Orleans, La., 2 March, 1841.

WILLIAM CAREY JONES. Recorder of the Faculty, 1876–7. Recorder of the Faculty and Instructor in Latin, 1877–1882. Recorder and Instructor in U. S. History and Constitutional Law, 1882–3. Instructor in U. S. History and Constitutional Law, 1883. Born Washington, D. C., 15 October, 1854. A.B., University of California, 1875. A.M., University of California, 1879.

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American Historical Association.

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F. B. KANE, M.D., M.R.C.S.I. Professor of Clinical Medicine and Pathology, 1882.

No reply received.

MARTIN KELLOGG. Professor of Latin and Greek, 1870–6. Professor of the Latin Language and Literature, 1876. Born, Vernon, Conn., 15 March, 1828. A.B., Yale, 1850. A.M., Yale, 1853.

Member of:

American Philological Association.

List of writings:

Latin Pronunciation: Pamphlet, pp. 18, 1864.
Reverence for Children.—*California Teacher*, March, 1865.
University Education.—*Overland Monthly*, September, 1868.
Gorgias in California.—*Overland Monthly*, December, 1868.
Ars Oratoria: pp. 160. Ivison, Blakeman & Co., New York, 1872.
Preparation for Holding Civil Offices.—*Berkeley Quarterly*, January, 1880.
A New England Farm.—*Californian*, September, 1880.
Old Colleges and Young.—*Californian*, June, 1881.
The Next Generation of Californians.—*Berkeley Quarterly*, July, 1881.
The Utility of Studying Latin.—*Californian*, November, 1881.
Authority.—*Overland Monthly*, December, 1883.
Over-Haste in Making Our Nation.—*Overland Monthly*, January, 1885.
Fine Art in Ancient Literature.—*Overland Monthly*, June, 1885.
The Call for Public Speaking.—*California Teacher*, December, 1885.

WALDEMAR GJÖTHROK KLEE. Gardener to the College of Agriculture, 1884–6. Born, Copenhagen, Denmark, 7 October, 1853.

Writings:

Culture of the Date, 1883. Published by the Dept. of Agriculture, Washington, D. C.

HERMANN KOWER. Instructor in Instrumental Drawing, 1885. Born, San Francisco, 17 June, 1861. C. E., Technische Hochschule, Stuttgart, Germany, 1884.

Member Ingenieur Verein, Stuttgart.

JOHN LE CONTE. Professor of Physics, Industrial Mechanics, and Physiology, 1870–1. Professor of Physics and Industrial Mechanics, 1871–5. Acting President of the University and Professor of Physics and Mechanics, 1875–6. President of University and Professor of Physics, 1876–1881. Professor of Physics, 1881. Born, Liberty County, Georgia, 4 December, 1818. A.B., Franklin College: University of Georgia, 1838. A.M., University of Georgia, 1841. M.D., College of Physicians and Surgeons, New York, 1841. LL.D., University of Georgia, 1879. General Secretary of the "American Association for the Advancement of Science" (Montreal Meeting), August, 1857. Professor of Natural Philosophy and Chemistry, University of Georgia, 1846–1856. Professor of Natural Philosophy, South Carolina College, 1856–1869.

Corresponding Member of "Academy of Natural Sciences" of Philadelphia, 1853.
Member of "American Philosophical Society" of Philadelphia, 1873.
Corresponding member of "New York Academy of Sciences," 1876.
Member of "National Academy of Sciences" (of North America), 1878.
Member of "California Academy of Sciences," 1878.
Honorary member of the "South Carolina Medical Association."
Honorary member of the "Medical Society of the State of California," 1872.
Honorary member of the "San Francisco Microscopical Society," 1881.
List of writings:

Scientific.

1. Case of Carcinoma of the Stomach.—*N. Y. Med. Gazette*, 1842.
2. On the Mechanism of Vomiting.—*N. Y. Lancet*, 1842.
3. On Carcinoma in General, and Cancer of the Stomach.—*N. Y. Lancet*, 1842.
4. On the Explanation of the Difference in Size of the Male and Female Urinary Bladder.—*N. Y. Lancet*, 1842.
5. An Essay on the Origin of Syphilis.—*N. Y. Journ. Med. and Collateral Sciences*, 1844.
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9. Experiments Illustrating the Seat of Volition in the Alligator, or Crocodilus, Lucius of Cuvier. With Strictures on the Reflex Theory.—*N. Y. Journ. Med.*, 1845 and 1846.
10. Statistical Researches on Cancer.—*Southern Med. and Surg. Journ.*, 1846.
11. On the Quarantine Regulations at Savannah, Ga.—*N. Y. Journ. Med.*, 1846.
12. Remarks on the Physiology of the Voice.—*Southern Med. and Surg. Journ.*, 1846.
13. Dr. Bennet Dowler's Contributions to the Natural History of the Alligator.—*Southern Med. and Surg. Journ.*, 1847.
14. On Sulphuric Ether.—*Southern Med. and Surg. Journ.*, 1847.
15. The Philosophy of Medicine. (An Address.)—*Southern Med. and Surg. Journ.*, 1849.
16. Observations on a Remarkable Exudation of Ice from the Stems of Vegetables, and on a Singular Protrusion of Icy Columns from certain kinds of Earth during frosty weather.—Proceedings of Am. Assoc. for Adv. Sci., 1850; also, *Phil. Mag.*, 1850.
17. Observations on the Freezing of Vegetables, and on the Causes which enable some Plants to endure the action of Extreme Cold.—*Am. Journ. Sci.*, 1852; also, Proc. Am. Assoc. for Adv. Science, 1851.
18. On the Venomous Serpents of Georgia.—*Southern Med. and Surg. Journ.*, 1853.
19. On the Descent of Glaciers.—*Am. Journ. Sci.*, 1855.
20. Review of Lieutenant M. T. Maury's Work on The Physical Geography of the Sea.—*Southern Quarterly Review*, 1856.
21. The Mechanical Agencies of Heat.—*Southern Quart. Review*, 1856.
22. Influence of the Study of the Physical Sciences on the Imaginative Faculties. An Inaugural Address, delivered December 1, 1857. A Pamphlet. Columbia, South Ca., 1858.
23. Preliminary Researches on the alleged Influence of Solar Light on the Process of Combustion.—*Am. Journ. Sci.*, 1857; also, *Proc. Am. Assoc. Adv. Sci.*, 1857; and *Phil. Mag.*, 1858.
24. On the Influence of Musical Sounds on the Flame of a Jet of Coal Gas.—*Am. Journ. Sci.*, 1858; also, *Phil. Mag.*, 1858.
25. On the Optical Phenomena presented by the Silver Spring in Marion County, Florida (U. S.).—*Am. Journ. Sci.*, 1861; also, *Proc. Am. Assoc. for Adv. Science*, 1860.
26. On the Adequacy of Laplace's Explanation to account for the Discrepancy between the Computed and the Observed Velocity of Sound in Air and Gases.—*Phil. Mag.*, 1864.
27. Limiting Velocity of Meteoric Stones Reaching the Surface of the Earth.—*Nature*, 1871.
28. Vital Statistics: Illustrated by the Laws of Mortality from Cancer.—*Western Lancet*, 1872.
29. Heat Generated by Meteoric Stones in Traversing the Atmosphere.—*Nature*, 1872.

30. The Nebular Hypothesis: Abstract of a Lecture Delivered fn May, 1869.—*Popular Science Monthly*, 1873.
31. Mars and his Moons.—*Popular Science Monthly*, 1879.
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36. Photographing Diffraction Rings—Optical Phenomenon.—*Nature*, 1881.
37. On Sound-Shadows in Water.—*Am. Journ. of Sci.;* also, *Phil. Mag.*, 1882.
38. Origin of Jointed Structure in undisturbed Clay and Marl Deposits.—*Am. Journ. of Sci.*, 1882.
39. Apparent Attractions and Repulsions of Small Floating Bodies.—*Am. Journ. of Sci.*, 1882; also, *Phil. Mag.*, 1883.
40. Amount of Carbon Dioxide in the Atmosphere.—*Phil. Mag.*, 1883.
41. Apparent Attractions and Repulsions of Small Floating Bodies.—*Science*, 1883.
42. Thermal Belts in North Carolina.—*Science*, 1883.
43. Freezing of Liquids in Living Vegetable Tissue.—*Science*, 1883.
44. Sun's Radiation and Geologic Climate.—*Science*, 1883.
45. Solar Constant.—*Science*, 1883.
46. Physical Studies of Lake Tahoe.—*Overland Monthly*, 1883–1884.
47. Upper Glow of the Skies in Relation to Halos and Coronæ.—*Science*, 1884.
48. The Remarkable Sunsets.—*Nature*, 1884.
49. Horizontal Motions of Small Floating Bodies in Relation to the Validity of the Postulates of the Theory of Capillarity.—*American Journal Science*, 1884; also, *Journal de Physique*, 1885.
50. Velocity of Atmospheric Waves from Krakatoa.—*Science*, 1884.
51. Points on Lightning Rods.—*Science*, 1884.
52. The Evidence of the Senses.—*North American Review*, 1885.
53. The Metric System.—*Overland Monthly*, 1885.
54. Do Young Snakes Take Refuge in the Stomach of the Mother ?—*Nature*, 1886.
55. Four (4) lectures on the Stellar Universe, delivered at the Peabody Institute, Baltimore, 1867. (Full MS. notes on file).

Miscellaneous.

1. A Series of Astronomical Articles on the Parallax of the Fixed Stars, and on the Existence of a Resisting Medium in the Planetary Spaces. Savannah, Ga. 1843.
2. Railway Axles. Savannah, Ga., 1843.
3. The Comet of 1843. Savannah, Ga., 1843.
4. Humbuggery. Savannah, Ga., 1844.
5. Faber's Speaking Machine. Savannah, Ga., 1844.
6. Mesmerism. Savannah, Ga., 1844.
7. Protection by Lightning-Rods. Savannah, Ga., 1845.
8. Pendulum Experiment. Athens, Ga., 1851.
9. Fallacies of the Senses—Sight. Athens, Ga., 1853.
10. Fallacies of the Senses—Temperature and Touch. Athens, Ga., 1855.
11. Function of Salt in Agriculture.—*S. Ca. Agriculturist*, 1856.
12. Comparative Value of Peat and Peat-Charcoal for Agricultural Purposes.—*S. Ca. Agriculturist*, 1856.
13. Origin of the Cherokee Rose, and Examples in Changes of Popular Names of Plants. —*S. Ca. Agriculturist*, 1856.
14. Extract from Lecture on The Study of the Physical Sciences. Abbeville, S. C., 1856.
15. Abstracts of Six Lectures on the Physics of Meteorology. Washington, D. C., 1857.
16. Tape-Worms of Man in Relation to the Measles of Hogs. Columbia, S. C., 1859. *Farmer and Planter, S. C.*, 1859.
17. Hail-Storms and the Cooling Effects of Ice. Columbia, S. C. 1859. *Farmer and Planter*, 1859.
18. Production of Sexes at Will.—*Rural Southerner*, 1866.
19. Harmony of Theory and Practice.—*Rural Southerner*, 1866.
20. Address to Graduates of University of California. Oakland, 1870.
21. Address to Graduates of University of California. Berkeley, 1875.
22. Address to Graduates of University of California. Berkeley, 1876.
23. Bonanza; Comstock Lode; Death Valley. Johnson's Cyclopedia, vol. IV, Appendix, 1876.
24. Relation of the High Schools to the University. San Francisco, 1876.—*California Teacher and Home Journal*, 1885.
25. The Aims and Objects of the Higher Education. An Address. University of California Bulletin, No. 27, 1877.
26. Importance of Unity in the methods of Instruction in the Public Schools. 1877.—*The California Teacher and Home Journal*, 1885.
27. Address to Graduates of University of California. Berkeley, 1878.
28. Igneous Meteors. Two Articles, 1879.—*Mining and Scientific Press Supplement.*
29. Decadence of Truthfulness. An Address. Berkeley, 1879.
30. Qualifications of Teachers for Primary Schools. 1879.—*Pacific School and Home Journal*, 1881.
31. Address to Graduates of University of California. Berkeley, 1880.

32. Origin and Distribution of Lakes; Meteorology of the Pacific Coast.—*Mining and Scientific Press and Supplement*, 1880–81.
33. Address to Graduates of University of California. Berkeley, 1881.
34. Influence of Modern Methods of Popularizing Science. An Address. Pamphlet. Berkeley, 1882.
35. The Part Played by Accident in Discoveries in Science.—*Berkeleyan*, 1884.
36. Bassnett's Theory of the Sun.—*The Overland Monthly*, 1885.
37. Thought Transference.—*The Overland Monthly*, 1885.

JOSEPH LE CONTE. Professor of Geology, Natural History, and Botany, 1870-2. Professor of Geology and Natural History, 1872. Born, Liberty County, Georgia, 26 February, 1823. A.B., Franklin College, University of Georgia, 1841. A.M., University of Georgia, 1845. M.D., College of Physicians and Surgeons, New York, 1845. B.S., Harvard College, 1851. LL.D., University of Georgia, 1879.

Member of:
National Academy of Science, 1875.
American Academy of Arts and Sciences. Boston, 1875.
American Philosophical Society. Philadelphia, 1873.
New York Academy of Sciences, 1876.
American Association for Advancement of Science, 1850. And again 1874.
Iowa Academy of Natural Sciences, 1879.
California Academy of Sciences, 1870.
California State Medical Society, 1872.
South Carolina State Medical Society. Honorary.

List of writings (most important only):
1. On the Science of Medicine.—*Southern Medical and Surgical Journal*, 1850.
2.* Agency of the Gulf Stream in the Formation of the Peninsula and Keys of Florida. *Am. Jour. of Science.*
3.* Three Lectures on Coal.—*Smithsonian Report* for 1857.
4. Geology in a Course of Education.—Inaugural address, 1857.
5. Morphology and its Connection with Fine Art.—*Southern Pres. Review*, 1858.
6.* Correlation of Vital with Physical and Chemical Forces.—*Am. Jour.*, 1859.
The same rewritten with additions.—*Pop. Sci. Monthly*, 1873. See below.
7. Principles of a Liberal Education.—*Southern Pres. Review*, 1859.
8. Female Education.—*Southern Pres. Review*, 1860.
9. Scientific Relation of Sociology to Biology.—*Southern Pres. Review*, 1860.
Same rewritten.—*Pop. Sci. Monthly*, 1879. See below.
10. The School, the College, and the University.—*Southern Pres. Review*, 1861.
Same rewritten.—*Princeton Review*, 1880.
11. Nature and Uses of Art.—*Southern Pres. Review*, 1863.
12.* Some Phenomena of Binocular Vision—1. Adjustments of the Eye.—*Am. Jour.*, 1868.
13.* Some Phenomena of Binocular Vision—2. Rotation of Eye on the Optic Axis in Convergence.—*Am. Jour.*, 1868.
14.* Some Phenomena of Binocular Vision—3. On the Horopter.—*Am. Jour.*, 1868.
15.* Some Phenomena of Binocular Vision—4. New Mode of Representing Visual Phenomena.—*Am. Jour.*, 1871.
16.* Some Phenomena of Binocular Vision—On an Optical Illusion.—*Phil. Mag.*, 1871.
17.* Some Phenomena of Binocular Vision—5. Stereoscopic Phenomena.—*Am. Jour.*, 1871.
18.* Some Phenomena of Binocular Vision—6. So-called Images of Illusion.—*Am. Jour.*, 1871.
19.* Some Phenomena of Binocular Vision—7. Transparency of Double Images.—Archives des Sciences, 1872.
20. Law of Circulation in Nature.—Published in Rep. of Cal. Teachers' Institute, 1871.
21.* Theory of Formation of Greater Inequalities of Earth's Surface.—*Am. Jour.*, 1872.
22.* Same subject.—Answer to Sterry Hunt's Criticism.—*Am. Jour.*, 1873.
23.* Some Ancient Glaciers of the Sierra Nevada—No. 1.—*Am. Jour*, 1873.
24. Agassiz Memorial Address.—Cal. Acad. Science Rep. for 1873.
25.* Great Lava Flood of the Northwest, and Structure and Age of the Cascade Mts.—*Am. Jour.*, 1874.
26.* Some Phenomena of Binocular Vision—No. 8. Position of Eyes in Sleepiness.—*Am. Jour.*, 1875.
27.* Some Phenomena of Binocular Vision—No. 9. Comparative Physiology of Binocular Vision.—*Am. Jour.*, 1875.
28.* Some Ancient Glaciers of the Sierra—No. 2—Lake Valley Glacier.—*Am. Jour.*, 1875.
29.* Rate of Growth of Corals.—*Am. Jour.*, 1875.
30. Instinct and Intelligence.—*Pop. Science Monthly*, 1875.
31* Evidences of Horizontal Crushing in the Formation of Coast Ranges of Cal.—*Am. Jour.*, 1876.
32.* Critical Periods in the History of the Earth and their Relation to Evolution.—*Am. Jour.*, 1877.
33.* Phenomena of Binocular Vision—No. 10. Structure of Crystalline Lens and its Relation to Peviscopism.—*Am. Jour.*, 1877.
34.* Some Thoughts on the Glycogenic Function of the Liver—No. 1.—*Am. Jour.*. 1878.
35.* Theory of Binocular Relief.—*Phil. Mag.*, 1878.

Those marked * are strictly scientific. The others are philosophical or else popular scientific.

36.* Structure and Origin of Mountains, with Special Reference to some Objections to Contractional Theory.—*Am. Jour.*, 1878.
37. Man's Place in Nature.—*Princeton Review*, 1878.
38. Science in Mental Culture.—*Pop. Sci. Monthly*, 1878.
39.* Geological Climate and Time.—*Nature*, 1878.
40. Scientific Relation of Sociology to Biology.—*Pop. Sci. Monthly*, 1879.
41.* Volcanoes about L. Mono, and their Relation to the Glacial Drift.—*Am. Jour.*, 1879.
42. Genesis of Sex.—*Pop. Sci. Monthly*, 1879. *Revue Scientifique*, 1880.
43. Effect of Mixture of Races on Human Progress.—*Berkeley Quarterly*, 1880.
44.* Glycogenic Functions of the Liver—No. 2.—*Am. Jour.*, 1880.
45.* Old River-beds of California.—*Am. Jour.*, 1880.
46. School, College, and University.—*Princeton Review*, 1880.
47.* Phenomena of Binocular Vision—No. 11. Laws of Ocular Motion.—*Am. Jour.*, 1880.
48. Evolution in Relation to Materialism.—*Princeton Review*, 1881.
49. Comte's Classification of Sciences.—*Berkeley Quarterly*, 1881.
50. Illustrations of a Law of Evolution of Thought.—*Princeton Review*, 1881.
51. Review of Wallace's Island Life.—*Californian*, 1881.
52. Higher Utilities of Science.—*Californian*, 1882.
53.* A Sketch of California Geology—in Contemporary Biography of California.—Bancroft, 1882.
54.* Mineral Vein-Formation now in Progress at Sulphur Bank.—*Am. Jour.*, 1882.
55. Mutual Relation of Intellectual and Moral Culture.—*Overland Monthly*, 1883.
56.* Mineral Vein-Formation at Steamboat Springs, Nevada.—*Am. Jour.*, 1883.
57.* Genesis of Metalliferous Veins.—*Am. Jour.*, 1883.
58.* Carson Footprints.—*Bull. of Cal. Acad. of Sci.*, 1883.
59. Psychical Relation of Man to Animals.—*Princeton Review*, 1884.
60.* On Continent-Formation.—*Geological Magazine*, 1884.
61.* Elevation and Subsidence of Earth Crust.—*Nature*, 1884.
62. Review of Fiske's Recreations of an Evolutionist.—*Overland*, 1884.
63. Review of Second and Third Reports of U. S. Geol. Survey.—*Science*, 1884.
64. Relations of Berkeley to Modern Religious Thought.—*Berkeleyan*, 1885.
65. General Principles of Art and their Application to the Novel.—*Overland*, 1885.
66. Review of Royce's Religious Aspects of Philosophy.—*Overland*, 1885.
67. Immorality in Modern Thought.—*Science*, 1885.
68.* Earthquake Shocks More Violent on Surface.—*Science*, 1885.
69.* Permanence of Continents and Ocean Basins, and Development of North American Continent.—*Geol. Mag.*, 1886.
70.* Post-Tertiary Elevation of Sierra Nevada.—*Am. Jour.* Not yet published.

Published books:
1. Religion and Science—A Series of Sunday Lectures. 1873.
2. Elements of Geology. 1878.
3. Sight—An Exposition of Principles of Monocular and Binocular Vision. 1881.
4. Compend of Geology for High Schools. 1884.

ABRAHAM LEWIS LENGFELD. Professor of Materia Medica and Medical Chemistry, 1882. Born, Auburn, N. Y., 25 December, 1850. M.D., Medical Dept. University of the Pacific, 1871. M.D., Cooper Medical College, 1882.

Member of:
American Pharmaceutical Association.
California Pharmaceutical Society.
California State Medical Society.
San Francisco County Medical Society.
Alumni Association, Cooper Medical College.
Honorary Member Alumni Association, Medical Department, University of California.
Honorary Member California State Odontological Society.

List of writings:
July 10, 1879—"On Repercolation."
Oct. 22, 1879—"Iodide of Ethyl."
Edited Pharmaceutical Department of the *Pacific Medical and Surgical Journal*, February, 1883, to December, 1883.

CHARLES HERBERT LEVERMORE. Instructor in History, 1886—. Born, Mansfield, Conn., 15 October, 1856. A.B., Yale, 1879. Ph.D., Johns Hopkins University, 1886.

Member of:
American Historical Association.

List of writings:
History of Witchcraft in Connecticut.—*New Englander*, 1885.
Criticism upon "The New Education."—*Education*, 1885–6.
The Republic of New Haven, a Study of Municipal Evolution. (In course of publication, by N. Murray, at the Publication Agency of the Johns Hopkins University.)

WILLIAM BREAKEY LEWITT. Professor of Anatomy (College of Dentistry), 1883. Born, Ann Arbor, Mich., 12 December, 1856. M.D., Detroit Medical College, Detroit, Mich., 1877. M.D., College of Physicians and Surgeons, N. Y., 1878.

Those marked * are strictly scientific. The others are philosophical or else popular scientific.

Member of:
S. F. County Medical Society.
California State Medical Society.

WILLIAM HENRY MAYS, M.D. Professor of Mental Diseases and Medical Jurisprudence, 1886—. Born, England, 22 January, 1846. M.D., University of California, 1873.
Member of:
State Medical Society of California.
American Association of Asylum Superintendents.

ANDREW FERDINAND McLAIN. Professor of Dental Pathology and Therapeutics, 1881–4. Clinical Instructor in College of Dentistry. Born, Parish St. Mary, La., 22 December, 1824. D.D.S., Philadelphia College Dental Surgery, 1856. M.D., University of La., 1858.
Member of:
New Orleans Academy of Sciences.
Odontological Society of the State of Louisiana.
California State Odontological Society.
List of writings:
Nitrous Oxide Gas, 1867.
Causes of Decay in the Human Teeth, 1867.
Prophylaxis, or Prevention to Dental Decay, 1869.
Pathology of Anæsthetics, 1872.
Therapeutical Treatment of the Dentinal Pulp, 1880.
Dental Literature and Education, 1881.
Introductory address at the opening of the Dental Department of the University of California, 1882.

W. F. McNUTT, M.D., M.R.C.P., Edin., etc. Professor of the Principles and Practice of Medicine, 1879.
No reply received.

FRED WELLINGTON MORSE. Assistant in Agricultural Laboratory, 1879. Born, Decorah, Iowa, 9 April, 1855. Ph.B., University of California, 1878.
Member of:
Berlin Chemische Gesellschaft.
Berkeley Science Club.
List of writings:
The Winged Phylloxera in California.—*The Overland Monthly*, March, 1883.
Spread of the Phylloxera by Grape Boxes.—*Cultivator's Guide*, April 10, 1883.
Decay of Grape Roots.—*Cultivator's Guide*, June 12, 1883.
Replanting Phylloxerated Vineyards.—*Cultivator's Guide*, June 24, 1883.
Report on the Occurrence of the Phylloxera in California.—Agricultural Department, 1880.
Report on work done in Viticultural Laboratory, etc.—Agricultural Department, 1882; p. 129.
Bulletin No. 19.—Agricultural Department, October, 1884.
Report to Viticultural Commission on Bauer's Mercury Remedy.—June 19, 1885.
Observations on the Life, History, and Habits of the Phylloxera in California.—Agricultural Department, 1886.
Report upon Experiments with Mercury Vapor as a remedy against the Phylloxera.—Agricultural Department, 1886.

BERNARD MOSES. Professor of History, 1875–6. Professor of History and Political Economy, 1876. Born, Burlington, Connecticut, 27 August, 1846. Ph.B., University of Michigan, 1870. Ph.D., University of Heidelberg, 1873.
List of writings:
The Negotiations on the Swedish Invasion of Germany. New Haven, 1874.
Georg Stjernhjelm, the Father of Swedish Poetry. New York, 1875.
The Beginning of Modern History. Berkeley, 1876.
The Protestant Hero of the Seventeenth Century. San Francisco, 1880.
Outlines of Lectures on the Constitutional History of England and Scandinavia. Oakland, 1878.
Social Science and its Method. Berkeley, 1880.
The Communism of Early Christianity. Berkeley, 1880.
The Crown and Parliament of Sweden. Berkeley, 1880.
Early Swedish Literature (including, with other matter, Georg Stjernhjelm.) San Francisco, 1881.
Swedish Literature in the Eighteenth Century. San Francisco, 1881.
The Extension of the Curriculum. San Francisco, 1881.
Henry George's Refutation of Malthusianism. San Francisco, 1881.
The Historical Foundation of Modern Society. San Francisco, 1881.
A Swedish Scholar. San Francisco, 1882.
Politics—An Introduction to the Study of Comparative Constitutional Law, by W. W. Crane and Bernard Moses. New York, 1884.
A Survey of the Field of Political Inquiry. Berkeley, 1885.
The Drift of Power in the English Government. San Francisco, 1885.
The Old Regime of San Francisco. San Francisco, 1886.

EDMOND C. O'NEILL, Ph.B. Instructor in Chemistry, 1879-1880. Assistant in Chemistry (Quantitative Laboratory), 1880-1. Assistant Instructor in Chemistry, 1881-2. Instructor in Chemistry, 1882-6. (At present on leave.)
No reply received.

EDWARD THOMAS OWEN. Professor of the French and Spanish Languages and Literatures, 1886—. Born, Hartford, Connecticut, 4 March, 1850. A.B., Yale, 1872.

PAUL F. PIODA. Professor of Modern Languages, 1870-8. Born, Brussells, 20 April, 1818. Student of University of Zurich, Switzerland.

H. J. PLOMTEAUX, D.D.S. Clinical Professor of Mechanical Dentistry, 1882-6. Resigned, 1886.
No reply received.

GEORGE HERMAN POWERS. Professor of Ophthamology and Otology, 1886. Born, Boston, Mass., 13 June, 1840. A.B., Harvard, 1861. A.M., Harvard, 1865. M.D., Harvard, 1865.
Member of:
San Francisco Medical Benevolent Society.
San Francisco County Medical Society.
California State Medical Society.
Harvard Club of San Francisco.
Former member of:
Massachusetts Medical Society.
Boston Society of Natural History.
San Francisco Academy of Sciences.

ALBIN PUTZKER, Instructor of German, 1874-1883. Professor of German Language and Literature, 1883. Born Eisenstadtl, Austria, 24 February, 1845.
Member of:
The Modern Language Association of America.
List of writings:
See Worman's Complete German Grammar (preface to sixth edition).
See Worman's Collegiate Reader (title page), edition of 1870.
The Educational Value of Chess. Article published in the *Adelphian*, Brooklyn, N. Y.
Die Universität von Californien.—*Erziehungsblaetter*, Milwaukee.
The Lay of the Nibelungen.—*Overland*, November, 1875.
The Song of the Bell: Students' paper, 1876.
Educational Problems.—*Santa Barbara Press*, May 10, 1873.
Der Kampf um eine Sprache.—*Oakland Journal*, June 28, and July 5, 1875.
Väterlicher Rath: poem.—*Oakland Journal.*
The Scientific Study of Languages.—*Scientific Press*, March, 1879.
An die Deutschen Oakland's.—*Oakland Journal.*
Die deutsche Sprache in Amerika: poem.—*Oakland Journal.*
Die Stadt San Jose.—*Oakland Journal*, April 4, 1885.
Fräulein Wagner's Vortrag.—*Oakland Journal*, February 28, 1885.
Ilse: poem.—*Cal. Demokrat*, 8 March, 1885.
The Gold-handled Riding Whip: translated from the Modern Greek.—*Overland*, April, 1885.
Die Reitpeitsche: translated from the Modern Greek.—*Cal. Demokrat*, April 26, May 3, May 10, 1885.
Baumbach's Frau Holde.—*Oakland Journal*, March 14, and March 21, 1885. Reprinted in the *Sacramento Journal.*
New Goethe Papers.—*Overland*, October, 1885.
Regarding Mr. E. B. Lamare's method of teaching the French Language.—*Le Guide*, April, 1885.
Die deutsche Universitäts-Bibliothek.—*Oakland Journal*, December 26, 1885.
An Giordano Bruno: poem.—*Oakland Journal*, January 23, 1886.
J. C. Bluntschle's Lehre vom Modernen Stat.—*Cotta, Stuttgart*, 1876; three volumes, first and second, and half of the third translated in conjunction with Wm. Carey Jones. In manuscript, specimen chapter from first volume printed.
Goethe's Greatness: a paper recently read in San Francisco; not yet printed.
Poem.—*Oakland Journal*, May 15, 1886.
Vereinspflichten.—*Oakland Journal*, May 22, 1886.
Weinlied: poem.—*Oakland Journal*, June 12, 1886.
Soldatenlied: poem.—*Oakland Journal*, June 19, 1886.

WILLIAM GALT RAYMOND. Instructor in Civil Engineering, 1884. Born, Princeton, Iowa, 2 March, 1859. C.E., Washington University, 1884.
Member of:
Technical Society of the Pacific Coast.
California Historical Society.

WILLIAM THOMAS REID. President University of California, 1881-5. Born, Jacksonville, Ill., 8 November, 1843. A.B., Harvard, 1868. A.M., Harvard, 1872.
List of writings:
Educational Reports.

AMBROSE CROSBY RICHARDSON. Instructor in Latin and Ancient History, 1874-5. Instructor in Latin and Greek, 1875-6. Born, Boston, Mass., 24 October, 1851. A.B., Harvard, 1873.

List of writings:

Methods of Classical Instruction.—*Education,* March, 1885.

WILLARD BRADLEY RISING. Professor of Chemistry and Metallurgy, 1872-6. Professor of Chemistry, 1876. Born, Mecklenburg, N. Y., 22 September, 1839. A.B., Hamilton College, 1864. M.E., Michigan University, 1867. M.A., Hamilton College, 1867. Ph.D., Heidelberg University, 1870.

Member of:

Die deutsche chemische Gesellschaft zu Berlin.

The Society of Official Chemists, Washington, D. C.

List of writings:

The Occurrence of Quicksilver at Sulphur Bank (a paper prepared conjointly with Dr. Jos. Le Conte), printed in Silliman's Journal and California Academy of Sciences Proceedings, etc.

JOSEPH CUMMINGS ROWELL. Recorder, 1874-5. Librarian, 1875 —. Born, Panama, S. A., 29 June, 1853. A.B., University of California, 1874.

List of writings:

University of California Library Bulletins, viz.:

1. 1880.—Catalogue of Periodical Literature.
2. 1881.—Notes on Library Progress and Description of the Library Building.
3. 1882.—Catalogue of the Library presented by Mr. H. D. Bacon.
4. 1882.—Catalogue of the Bacon Art Gallery.
5. 1884.—Catalogue of the Loan Book Exhibition, 1884.
6. 1885.—Catalogue of the Hittell Collection of Sculpture Photographs.

EDWARD W. RUNYON, Ph.G. Professor of the Theory and Practice of Pharmacy, 1881-. Dean of the Pharmaceutical Faculty. Born, Chicago, Ill., 7 November, 1851. Ph.G., New York College of Pharmacy, 1873.

Member of:

American Pharmaceutical Association.

California Pharmaceutical Society.

List of writings:

Sophistication in Cane Sugar (coloring matter). 1875.

Notes on Beberis Aquifolium. 1880.

Paper on Syrup Iodide of Iron, U. S. P. 1880.

Practical Notes on the Manufacture of Phosphoric Acid by Aërial Oxidation. 1883.

JOACHIM HENRY SENGER. Instructor of German, 1886. Born, Coeslin, Prussia 11 September, 1848. A.B., University of California, 1882.

List of writings:

Chamisso in San Francisco in 1816.—*Pacific School Journal,* 1882.

The Data of a Science of Comparative Literature. Library, University of California, 1883.

Chinese Immigration.—*N. Y. Nation,* No. 976, 1884.

G. A. SHURTLEFF, M. D. Professor of Mental Diseases, 1877-8. Professor of Mental Diseases and Medical Jurisprudence, 1878-1885. Emeritus Professor of Mental Diseases and Medical Jurisprudence, 1885. Born, Carver, Mass., 5 August, 1817. M.D., Vermont Medical College, 1845.

Member of:

American Medical Association (National).

State Medical Society of California.

San Joaquin County Medical Society.

The Association of Medical Superintendents of North American Institutions for the Insane.

List of writings:

Address before the State Medical Society of California (as President thereof), on "The Medical Jurisprudence of Insanity." Published by the Society in its proceedings, and in pamphlet for distribution, 1872.

A paper on "The Obscure Forms of Epilepsy," read before the State Medical Society of California, and published in its proceedings.

A paper on "Suicide," read before the San Joaquin County Medical Society, and published by the Society in pamphlet form.

Numerous other papers, reports, and contributions on the subject of insanity.

CHARLES WILLIAM SLACK. Acting Professor of Municipal Law, 1885. Born, Mifflin, Pennsylvania, 12 December, 1858. Ph.B., University of California, 1879. LL.B. University of California (Hastings College of the Law), 1882.

FREDERICK SLATE. Instructor in Chemistry, 1875-7; Superintendent of Physical Laboratory, 1879-1881; Superintendent of Physical Laboratory and Instructor in Physics and Mechanics, 1881-6; Assistant Professor of Physics and Mechanics, 1886. Born, London, England, January, 1852. B.S., Polytechnic Institute, Brookiyn, New York, 1871.

ADOLPH SOMMER. Assistant in Chemistry, 1884. Born, Zechow, Germany, 9 February, 1857. Ph.G., University of California (College of Pharmacy), 1879.
Member of:
California Pharmaceutical Society.
Society of Chemical Industry.
List of writings:
Determination of Lead from its Ores by Electrolysis.—*Scientific American*, Supplement Vol. XV, p. 209.
The Manufacture of Bromhydric Acid.—*Pharmaceutical Record*, Vol. IV, p. 6, etc.
The Manufacture of Mercurial Preparations.—*American Druggist*, Vol. XIV, p. 42, etc.
The Manufacture of Phosphoric Acid.—*Pharmacist*, Vol. XIX, p. 361, etc.
The Oxidation of Phosphorous to Phosphoric Acid by Means of Bromine.—*Pharmacist*, Vol. XIX, p. 373, etc.

FRANK SOULÉ. Assistant Professor of Mathematics, 1870-1872. Professor of Civil Engineering and Astronomy, 1872. Born, Woodville, Miss., 6 August, 1845. Graduate U. S. Military Academy, West Point, 1866. 2d Lieut. U. S. Ordnance.
Member of:
Technical Society Pacific Coast.
California Historical Society.
List of writings:
Contributions to daily press since 1869.
Letters descriptive of tour in Europe.
Editorials in *California Teacher.*
Report on water supply of University of California, 1872-3.

FRANCIS HOVEY STODDARD. Instructor in English, 1886. Born, Middlebury, Vt., 25 April, 1847. A.B., Amherst, 1869. A.M., Amherst, 1886.
List of writings:
New Englander, September, 1883.
New Englander, January, 1884.
New Englander, July, 1885.
New Englander, July, 1886.

IRVING STRINGHAM. Professor of Mathematics, 1882. Born, Yorkshire, New York, 10 December, 1847. A.B., Harvard, 1877. Ph.D., Johns Hopkins University, 1880. Highest Honors in Mathematics, Harvard, 1877.
Member of:
British Association for the Advancement of Science.
American Association for the Advancement of Science.
Technical Society of the Pacific Coast.
List of writings:
1. Investigations in Quaternions, viz.:
(*a*) Logarithms of Quaternions.
(*b*) Applications of Quaternion Analysis to Rectification of Curves, Quadrature of Surfaces and Cubature of Solids. (Thesis of a Candidate for Mathematical Honors conferred with the degree of B.A., at Harvard College, at Commencement, 1877.—Published in the Proceedings of the American Academy of Arts and Sciences, 1878.)
2. Some General Formulæ for Integrals of Irrational Functions.—*American Journal of Mathematics*, Vol. II, 1879.
3. The Quaternion Formulæ for Quantification of Curves, Surfaces, and Solids, and for Barycentres.—*American Journal of Mathematics*, Vol. II, 1879.
4. Regular Figures in N-Dimensional Space.
(Thesis of a Candidate for the degree of Ph.D., conferred at Johns Hopkins University, 1880.—Published in *American Journal of Mathematics*, Vol. III, 1880.)
5. Determination of the Finite Quaternion Groups.—*American Journal of Mathematics*, Vol. IV, 1881.
6. On a Geometrical Interpretation of the Linear Bilateral Quaternion Equation.—Proceedings of American Association for the Advancement of Science, 1884.
7. On the Rotation of a Rigid System in Space of Four Dimensions.—Proceedings of the American Association for the Advancement of Science, 1884.
8. Analytical Politics (Review).—*Overland Monthly*, January, 1885.
9. Stedman's Poets of America (Review).—*Overland Monthly*, March, 1886.

MAURICE J. SULLIVAN, D.D.S. Demonstrator of Salivary Analysis, 1881-2. Demonstrator of Operative Dentistry, 1882-3. Demonstrator of Operative Dentistry and Instructor in Salivary Analysis, 1883-4. Clinical Professor of Operative Dentistry, 1884—. Born, Marysville, California, 1 February, 1858. D.D.S., University of Michigan, 1880.
Member of:
California State Odontological Society.

BENJAMIN R. SWAN, M.D. Professor of the Diseases of Children, 1883—.
No reply received.

W. E. TAYLOR, M.D. Professor of the Principles and Practice of Surgery, 1881—. Born, Richmond, Va., 7 December, 1837. M.D., Winchester Medical College, 1859. Asst. Surgeon U. S. N., 1859. Surgeon U. S. N., 1862. Medical Inspector U. S. N., 1876.
Member of:
National American Medical Association, 1871.

Fellow of American Surgical Association, 1884.
Honorary Member State Medical Society of California, 1871.
Honorary Member State Medical Society of California, 1886.
President San Francisco County Medical Society, 1886.
Honorary Member Odontological Society, California.
Member Alumni Association, Medical Department, University of California.
One of the Vice-Presidents of the Section of Military and Naval Surgery, Ninth International Medical Congress, 1887.
Member California Historical Society.
Surgeon in Chief St. Luke's Hospital, San Francisco, California.
Member Naval Library, Cronstadt, Russia, 1866.
Life Member Imperial River Yacht Club, at Cronstadt, Russia, 1866.
Member River Yacht Club, St. Petersburg, Russia, 1866.
Honorary Member Russian Merchants' Society for Mutual Assistance, St. Petersburg, Russia, 1866.
Companion Military Order Loyal Legion, U. S.
Comrade Grand Army Republic.

F. H. TERRILL, A.M., M.D. Professor of Therapeutics, 1883.
No reply received.

WILLIAM THOMAS WELCKER. Professor of Mathematics, 1870—1881. Born, Athens, Tenn., 24 June, 1830. Graduate U. S. Military Academy, West Point, 1851.
Member of:
California Historical Society.
List of writings:
Welcker's Military Lessons.
Welcker's Advanced Algebra.
Welcker's Practical Arithmetic (unpublished).
Fugitive pieces, lectures, etc., not preserved.

WILLIAM T. WENZELL, M.D. Professor of Chemistry in the College of Pharmacy, 1877—. Born, Mühldorf, Bavaria, 19 January, 1829. Ph.G., Philadelphia College of Pharmacy, 1855. M.D., Medical College of the Pacific, 1876.
Member of:
California Academy of Sciences.
American Chemical Society.
California Pharm. Society.
List of writings:
Proximate Analysis of Carydalis Formosa.—*Am. J. Pharm.*, 1855.
Proximate Analysis of Euonymus Arbropurpureus.—*Am. J. Pharm.*, 1862.
On the Active Constituents of Ergot of Rye.—*Am. J. Pharm.*, 1864.
Report on Progress in Pharmacy for 1869.—Proceedings Amer. Phar. Assoc., 1870.
Analysis of Cinchoquinine.—*Am. Journ. Ph.*, 1870.
The Most Delicate Color Test for Strychnia.—*Am. Journ. Pharm.*, 1870.
The Preparation of Potassium Ferridcyanide from Potassium Ferrocyanide by means of Nascent Chlorine.—*Chicago Pharmacist*, 1870.
Abietine, a New Hydrocarbon.—*Am. Journ. Pharm.*, 1872.
The Preparation of Diluted Alcohol U. S. P. by simple ratios from Alcohol of any strength, with table.—Proceedings of Am. Ph. Assoc., 1879.
On the Preparation of Phosphoric Acid by Moist Aerial Oxidation of Phosphorus.—Proceedings of Am. Ph. Assoc., 1882.
Other papers of minor import published in the Proceedings of the Cal. Pharm. Society.

EDWARD J. WICKSON. Lecturer on Dairying, 1884-5. Lecturer on Practical Agriculture, 1885-6. Lecturer on Practical Agriculture and Assistant Superintendent of the Experimental Grounds, 1886. Born, Rochester, N. Y., 3 August, 1848. A.B., Hamilton College, 1869. A.M., Hamilton College, 1872.
Member of:
San Francisco Microscopical Society.
Associate Editor Utica (N. Y.) *Morning Herald*, 1871-5.
Editor *Pacific Rural Press*, 1875 to date.

ABRAHAM M. WILDER (Deceased). Professor of Ophthalmology and Otology, 1881-6. Born, Bolton, Mass., 3 May, 1840. M.D., Georgetown University ,1863.
Member of:
American Medical Association.
California State Medical Society.
San Francisco County Medical Society.
San Francisco Medical Benevolent Society.

JOSEPH W. WINANS, A.M., Dean of the Law Faculty, 1885.
No reply received.

APPENDIX B.

ELEVENTH ANNUAL REPORT ON THE LIBRARY.

Library of the University of California,
Berkeley, July 1, 1886.

To the President of the University:

Sir: I have the honor to submit my eleventh annual report—a brief synopsis of the progress and work of the Library for the thirteen months ending June 30, 1886.

ATTENDANCE.

A slight increase in the number of readers over that of former years is to be noted.

1886.	A. M.			P. M.				Average.
	10.	11.	12.	1:30.	2:30.	3:30.	4:30.	
April	42.4	41.3	24.2	31.9	34.3	29.9	21.1	32.2
May	47.8	43.9	22.9	30.3	33.2	29.4	24.3	33.1
Term average								32.6

Term average, 1878	320 students,	26.2
Term average, 1880	217 students,	20.0
Term average, 1882	190 students,	21.1
Term average, 1883	215 students,	30.0
Term average, 1885	241 students,	32.1
Term average, 1886	243 students,	32.6

For the years not mentioned, owing to press of work or other causes, no census of readers was taken. The census is taken during the two middle months of the second term of the academic year, when many of the students whose names appear on the Register are not in actual attendance. The result, therefore, indicates the *minimum* of attendance.

I note with pleasure that as the resources of the Library are developed the number of those consulting, not connected with the University, is increasing. In particular may be mentioned the members of the Ebell Society, of Oakland, who study some topics under the advice of the Professor of English Language and Literature.

GROWTH.

The accessions register shows that there are now in the Library 31,275 volumes, of which there have been received during the past year:

(*a*) By purchase (State appropriation)	1,902 volumes.	
(Reese Fund)	256 volumes.	
(German Library Fund)	765 volumes.	
		2,923 volumes.
(*b*) By gift	1,098 volumes.	
(To German Library)	28 volumes.	
		1,126 volumes.
(*c*) By binding of periodicals		452 volumes.
Total		4,501 volumes.

Pamphlets to the number of 1,098 have been presented.

The character of the new books purchased has been of the highest, owing to the careful method of selection here in use, and they are proportionately distributed, as to number, to the importance to the University of the various departments of knowledge. The real number of the accessions to the German Library is larger than the apparent number, owing to the fact that, to save cost of binding, and thus permit the purchase of a larger number of distinct works, the books have been bound at the rate of two, three, or more, in one volume.

GIFTS.

A list of the donors of the past year is appended, from which it will appear that the institution is becoming more widely and favorably known at home and abroad.

The most important gift this year was that of Regent A. S. Hallidie, which embraced a large variety of seventeenth and eighteenth century theology, some being rare works. A catalogue of these (Library Bulletin No. 7) has just been published. George D. Dornin, Esq., has contributed a set of H. H. Bancroft's historical works in nineteen volumes. The alumni of the University frequently, by gifts, indicate the affectionate remembrance and esteem they bear towards Alma Mater; and one of them, Frank W. Maher, of the Class of 1878, made a bequest of his private library of engineering works (41 volumes): the first instance of the kind on our records. From the U. S. Chief of Engineers were received sixty-seven maps and charts; and from the U. S. Geological Survey, forty-nine map sheets. The Class of 1889 presented a specimen class pin, in gold and enamel. Several photographs have been presented by John S. Hittell, Esq., Mrs. Bernard Moses, J. R. Little, Esq., and Col. J. M. Keeler. Mr. Wm. D. Armes, of the Class of 1882, U. C., presented ninety-six coins, mostly copper.

The Students' Loan Library, established this year at the suggestion of Prof. A. S. Cook, numbers fifty-eight volumes, under the charge of Mr. Sanderson, of the Class of 1887.

SUMMARY OF ACCESSIONS.

YEAR.	Purchase.	Gift.	Binding.	Exchange.	Total.
1875–76	1,263	116	300	4	1,683
1876–77	62	673	4	2	741
1877–78	293	140		2	435
1878–79	821	414	168	2	1,405
1879–80	9	146			155
1880–81	311	219	201		731
1881–82	1,829	1,704	187	4	3,724
1882–83	1,181	441	245	2	1,869
1883–84	1,550	773	134		2,457
1884–85	1,779	531	13	2	2,325
1885–86	2,923	1,126	452		4,501

The munificence of the State will enable other large accessions to be made before the end of the present calendar year.

LOSSES.

The losses by theft from the library have been numerous; the total number missing being twenty-four. As no inventory was taken last year, owing to pressure of other work, this number represents our losses for two full years. The annual inventory this year occupied our spare time for two weeks, and was finished on June first, since which date nine additional volumes, then lost or missing, have been found. Others later on will be returned or be found misplaced or hidden behind the book-rows, as in the past.

While the Librarian feels a personal grief in the loss of books under his charge, he can see no absolute means of prevention while students enjoy unrestricted access to the shelves. At no time during the past eleven years has there prevailed the practice of unauthorized borrowing so prevalently as during the present year.

This question of free access of college students to the shelves of libraries has ever proved a matter of much perplexity; the advantages of the custom being obvious and numerous. Some college librarians bear testimony as to the good results of the open system, as Professor Guild, of Brown University, and Professor Robinson, of Rochester (see his enthusiastic praises in the Government Library Report of 1876, pp. 516–519); and yet others express a different opinion. The close system is the prevailing one among large college libraries, and the College of New Jersey this year adopted the latter plan.

NOTES OF WORK—INDEXING.

During the past year, in addition to the ordinary cataloguing of new books, all works received falling in the departments of general literature, philology, philosophy, history, biography, travels, social and economical sciences, and general works of science, *in all languages*, have been indexed as soon as received. Many works in the department of theology and law have received like treatment. The indexing of current periodical literature in the above named subjects has been continued; and the work is so nearly up to date that, although nearly sixteen hundred volumes were received during the month of June, 1886, but about ten are as yet unindexed, and only three to be catalogued analytically in the author catalogue.

This service of indexing I consider of equal importance with the catalogue work ordinarily carried on in every library. *Hic jacet* should not be the shelf number of any book. Books skulk. Like a drill sergeant, the librarian must compel them to maintain their rank. A few press themselves upon notice, but the majority do not compel our attention unless we put each on its own vantage ground. Each must be persistently questioned until all its worth is discovered and recorded. Without this discipline the library is but a "mob of books."

HOURS.

During the past year the library has been open from 8:20 A. M. until 5:15 P. M. daily during term time; on Saturdays it has been closed at 1 P. M. During the long vacation of 1885 it was open on every Monday, Wednesday, and Friday afternoon.

PHOTOGRAPH EXHIBITION.

Beginning on March twenty-fourth (Charter Day), and closing with May eighth (Field Day), a public exhibition of the extensive collection of photographs of sculpture, presented by Mr. Hittell, was held in the Art Gallery, and was viewed by over 1,746 adults. Owing to the fact that the door to the Art Gallery is in the vestibule of the library building, and because no assistant was regularly in charge, it is believed that many of the visitors escaped notice. Many deemed the collection worth several visits, and it was made the subject of diligent study by the two lower classes in theme work. The exhibition widely advertised the collection, which is frequently called for examination by visitors and others.

CIRCULAR TO TRADES UNIONS.

In April a circular was sent to over fifty trades and labor unions of San Francisco, requesting copies of their constitutions, by-laws, and any other printed documents. Few returns were made directly to the library, but Mr. G. T. Clark, taking the matter personally in hand, succeeded in procuring over twenty pamphlets, which we hope will not be valueless in illustrating a certain social phase of California history.

GERMAN LIBRARY.

The method of forming a German library here pursued, it is interesting to note, has been followed elsewhere, and the library of the University of Wisconsin, and those using it have benefited thereby.

CORRESPONDENCE.

Although no *systematic* attempt has been made as yet to open exchange with scientific and learned bodies, domestic and foreign, yet correspondence with a considerable number has elicited a few favorable replies. The need of establishing some kind of a University Bulletin, or other publication, wherein can be published results of research and work by members of the various faculties, and even certain kinds of work by students, to be used as a medium of exchange, is respectfully alluded to.

Numerous answers in reply to letters of inquiry from alumni and others desiring information have been written. It is a pleasure to render any assistance to our graduates; and if we cannot send them our books for reference, the *list* of references we *can* send often enables them to study the subject in hand from books accessible.

From private sources of information I note a growing liberality as regards the use of books in eastern libraries—one library making loans to another at a distance. Such action is not often mentioned in the annual reports, because as yet rules covering cases of this kind have not been adopted. The tendency to coöperate can be displayed in few more useful ways, and it is to be hoped that our own collection—in large measure the result of public munificence and private generosity—may be of service to others than those who enjoy personal access to our shelves.

This library during the past, as in former years, has contributed to the quarterly continuation of Poole's Index to periodical literature.

ART GALLERY.

I have to remark with pleasure that the spring months of 1886 brought to us a large number of intelligent and critically appreciative visitors from the Eastern States. The number of visitors to the Art Gallery since its opening is as follows:

1882, May 29 to May 31	1,238
1882–3	4,459
1883–4	3,840
1884–5	3,286
1885–6 (13 months to July 1)	4,381
Total	17,204

All of which is very respectfully submitted.

J. C. ROWELL,
Librarian.

APPENDIX I.

DONATIONS TO THE LIBRARY, 1885-6.

	Books.	Pamphlets.
Alabama Historical Society	------	3
Albany Law School	------	1
Alderton, George E., New Zealand	1	------
Allen, Joseph H., Boston	1	------
American Association of the Red Cross	1	------
American Institute of Mining Engineers	1	------
American Philosophical Society	------	3
Anderson, J. A., M.D., San Francisco	------	3
Andover Theological Seminary, Massachusetts	------	2
Anonymous	2	------
Apprentices Library, New York	------	2
Archaelogical Institute of America	------	2
Arkansas Industrial University	------	2
Armes, Wm. D., Class of 1882, U. C.	------	4
Ashburner, William	2	------
Astor Library, New York	1	1
Austin, S. W., Class of 1886, U. C.	------	1
Ayers, Howard, Ann Arbor	------	2
Barker, James L., Berkeley	------	2
Bates College	------	1
Bartlett, G. H.	------	2
Becker, George F., Washington	------	2
Bee, Col. F. A., Chinese Consulate, San Francisco	------	4
Berea College, Kentucky	------	1
Berkeleyan Stock Company	2	1
Biedenbach, Chas. L., Class of 1886, U. C.	------	1
Blankenhorn, Adolph, Karlsruhe	11	1
Bostinian Society	------	1
Boston Public Library	------	2
Boston Record Commission	3	------
Bowdoin College Library	------	2
Bowie, Jr., A. J., San Francisco	------	1
Bradley, Prof. C. B.	2	2
Brauner, John C.	------	1
Brewer, W. A., Class of 1885, U. C.	------	2
British Association Advancement of Science	1	------
Bridge, Samuel J., Boston	1	------
Brooklyn Library, New York	------	3
Brown University	------	1
Bryn Maur College, Pennsylvania	------	3
Buck, E. W., M.D., Oakland	------	4
Buckland, C. R.	1	------
Buckley, C. P., M.D.	1	------
Buffalo Historical Society	------	1
California Academy of Sciences	------	1
California State Normal School, San José	------	1
Canada Geological Survey	1	4
Carswell & Co., Toronto	------	1
Casey, W. P., San Francisco	------	1
Center College, Kentucky	------	1
Chalmers, Patrick, London	------	1
Chamberlain, Thos. C., U. S. G. S.	------	1
Chicago College of Physicians and Surgeons	------	1
Chicago Historical Society	3	3
Chicago Public Library	------	1
China Imp. Maritime Customs, Shanghai	------	1
Cincinnati Public Library	1	------

	Books.	Pamphlets.
Cincinnati University		1
Civil Service Reform Association of Philadelphia		10
Civil Service Reform of California, T. S. Burnell, Secretary		19
Civil Service Reform League (National)		20
Clark, Chas. K., Berkeley		1
Clark, F. S., Class of 1882, U. C.		2
Clark, Geo. T., Class of 1886, U. C.	2	17
Class of 1886, English Section, U. C.	1	
Class of 1887, University of California	2	
College of Holy Cross, Worcester, Massachusetts		1
College of St. Augustine, Benicia, California		11
Colorado Agricultural College		1
Columbia College, New York		4
Cook, Prof. A. S.	2	10
Cook, Prof. Geo. H.	2	1
Cornell University		4
Culmer, Sr., Frederick, Salt Lake City	1	1
Cumberland University, Tennessee		1
Dalton, Joseph D., Boston		1
Dame, Luther, Newbury, Massachusetts		1
Davenport Academy of Natural Sciences	4	
Davis, Hon. Horace	1	1
Delta Kappa Epsilon (quarterly)		11
Deseret University		1
Diplomatic Review, London	7	
Dornin, George D., Berkeley	19	
Dwinelle, C. H.		6
Edinburgh Royal Observatory	1	1
Edmonds, Harry M., Class of 1882	1	3
Edwards, Prof. George C.		1
Elisha Mitchell Scientific Society, N. C.	1	1
Essex Institute, Salem, Massachusetts		8
Feusier, H. E. C., Class of 1885, U. C.	1	
Fisk University		1
France, Ministère de l'Agriculture		3
Frazer, Dr. Persifor		3
Georgia Agricultural Commissioner		12
Gibson, A. M.	1	
Gilbert, G. K.		1
Gilman, D. C., Balt.		2
Gompertz, Charles F.		1
Greene, E. L.	4	
Grover, Alice K., Class of 1887, U. C.	1	
Hager, Hon. J. S.	1	
Hall, Dr. Asaph, Washington	2	
Hallidie, Andrew S. (See Library Bulletin, No. 7.)	579	6
Hampton Normal and A. Institute, Va.		1
Hanks, Henry G.	1	
Hanover College		1
Harris, J. Ham.	1	
Harvard University	3	10
Holden, Pres. E. S.	6	14
Harden, W. H., Savannah		1
Harrison, J. B.		1
Hastings, S. Clinton, LL. D.		2
Healdsburg College, California		1
Hittell, John S.		1
Howison, Prof. G. H.		3
Hough, Prof. F. B., Danville, New York		1
Italy, R. Countato Geologico	1	1
Italy, Ministero d'Agricultura	1	

Donations to the Library—Continued.

	Books.	Pamphlets.
Jackson, Prof. A. Wendell		3
Jenkins, W. R., New York		1
Johns Hopkins University		12
Kansas Agricultural College		2
Kansas Normal School, Paola		1
Kellogg, Prof. Martin	2	9
Klemm, C. R., Ohio		2
Lacey, Hon. E. S.	1	
LeConte, Dr. John	2	8
Longfeld, Prof. A. L., S. F.		7
Lewis, H. Carvill, Philadelphia		2
Librarian		10
Lindley, Dr. Walter, Los Angeles		4
Livingston County Historical Society, New York		1
Long Island Historical Society		1
Los Angeles Branch State Normal School		1
Low, Lyman H., New York		8
Lowell, Old Residents' Historical Association		1
Luther College, Decorah, Iowa		2
Lyons, France, Laboratoire d'Études de la Soie		1
McAllister, Elliot, Class of 1885, U. C.	1	
McDonnell Bros., Chicago		1
McLain, A. F., M.D., D.D.S.		4
Maher, Frank W., Class of 1878, U. C.	41	
Maine Missionary Society		1
Marye, George T., Jr.	1	
Marysville College, Tennessee		1
Massachusetts Agricultural College	1	
Massachusetts Board of Health	1	
Massachusetts Institute of Technology		3
Massachusetts Board of Education	1	
Massachusetts State Agricultural Exposition Station		8
Massachusetts State Library		1
Mayer & Müller, Berlin	1	
Mays, W. H., M.D., Stockton		1
Mercantile Library, San Francisco		1
Mexico, Minister of Public Works	1	
Michigan State Agricultural College	1	1
Milan, Regio Instituto Tecnico Superiore		1
Miller, Hon. J. F. (besides thirty-eight duplicates)	10	5
Miller Manual Labor School, Albemarle		1
Mills' College, California		5
Minnesota University		1
Mississippi Agricultural and Mechanical College		1
Missouri State Agricultural College		1
Monterola, Ramon, Mexico	1	
Morgan, G. F. U., San Francisco		1
Moses, Professor Bernard		2
National Association of Wool Manufacturers	1	
New England Methodist Historical Society, Boston		1
New Hampshire Agricultural and Mechanical College		1
New Hampshire Historical Society		3
New Mexico, Secretary of Territory	1	
New Orleans University		1
New York Agricultural Society, Albany		1
New York Historical Society	1	
New York Microscopical Society		3
New York Post Graduate Medical School Clinical Society		1
North Carolina Agricultural Exposition Station	5	4
Northwestern University, Evanston, Illinois		2
Oakland, California, Free Library	1	1
Oberlin College		1
Ohio State Agricultural Exposition Station		1
Ohio State University		3
Old Newbury, Massachusetts, Historical Society	1	

DONATIONS TO THE LIBRARY—Continued.

	Books.	Pamphlets.
Oneida Historical Society, Utica, New York	------	2
Occident Stock Company	3	2
Pacific Coast Liberal Christian Conference	------	1
Palmer, C. T. H. (besides 83 duplicates)	61	262
Palmer, Henry A., Berkeley	12	------
Park, John R., Salt Lake City	------	1
Partsch, Dr. Herman, Class of 1881, U. C.	1	------
Peabody Institute, Baltimore	1	1
Fenn St. College, Harrisburg	------	2
Perez, Hernando Herrais, Mexico	4	2
Phi Gamma Delta	------	1
Philadelphia Library Company	------	2
Philadelphia Presbyterian Hist. Society	------	1
Philips Exeter Academy	------	1
Pillsbury, Parker, Concord, N. H.	------	3
Price, W. E., Dental College, 1883	------	1
Powers, George H., M.D.	------	4
Purdue University	------	4
Ramm, Chas. A., Class of 1884	1	------
Raymond, Wm. G.	------	3
Recorder's Office, U. C.	4	138
Rhoda, Franklin, Class of 1873	------	3
Rhode Island Commissioner of Public Schools	1	------
Ripon College	------	1
Rising, Prof. W. B.	1	------
Rodgers, Arthur, Class of 1872, U. C.	------	2
Rome, Regia Universita degli Studi	------	1
Rosecrans, Hon. W. S.	23	22
Roy, Protap Chandra, India	------	9
Royal College Physicians and Surgeons, Kingston	------	1
Royce, Josiah, Class of 1875, U. C.	1	------
Rutgers College, N. J.	------	2
St. Ignatius College, San Francisco	------	1
St. John's College, Maryland	------	1
St. Louis Mercantile Library Association	------	1
St. Louis Public Library	------	1
St. Matthew's Hall, San Mateo	------	1
San Francisco Board of Supervisors	1	------
San Francisco Bookbinders' P. and B. Association	1	------
San Francisco Brotherhood, Carpenters and Joiners of America	------	1
San Francisco Cabinet Makers' Union	------	1
San Francisco Chamber of Commerce	------	1
San Francisco I. O. O. F. Association	------	1
San Francisco Jewelers' Mutual Aid Society	------	1
San Francisco 'Longshore Lumbermen's Protective Association	------	1
San Francisco Subdivision Int. Bro. Loc. Engineers	------	1
San Francisco White Cooks and Waiters' Union	------	1
Saunders, Prof. Wm., Ottawa	------	1
Sauveur Summer College of Language	------	1
Schorr, George F., Class of 1882, U. C.	------	1
Scobie, Margaret, Class of 1884, U. C. (to Germ. Library)	25	------
Scott, P. M.	------	1
Secretary's Office, U. C.	1	2
Sheffield Scientific School	------	1
Sherman, Hon. Roger	------	1
Sievers, J. H., San Francisco	------	1
Slack, Professor C. W., Class of 1879, U. C.	------	11
Slate, Professor F., Jr.	------	1
Smithsonian Institution	7	------
Sommer, Adolph	2	3
Southern California University	------	1
Sotheran & Co., London	2	------
State Agricultural College, Orono, Maine	------	1
Stauffer, Th., Leipsig	2	------
Stewart, William M.	------	2
Storer, Dr. R. H., Newport, R. I.	------	12

Donations to the Library—Continued.

	Books.	Pamphlets.
Stringham, Professor Irving	9	
Storr's Agricultural School, Conn.		1
Taylor, President John, Salt Lake City, Utah	20	2
Technical Society of the Pacific Coast	2	
Texas Agricultural and Mechanical College		2
Thompson, Hon. T. L., Secretary of State of California	8	
Todd, D. P., Amherst		4
Tokio University		2
Trinity College, Hartford		2
Tualitan Academy, Oregon		1
Turner, D. K., Harrisville, Pa		1
Union University, New York		1
United States, various departments	172	106
United States Adjutant-General		4
United States Military Academy		1
University of California, College of Dentistry		1
University of California, College of Medicine		2
University of City of New York		3
University College, Toronto		1
University of Kentucky		2
University of Michigan		1
University of Mississippi		4
University of Missouri		1
University of Nevada		1
University of North Carolina		4
University of Pennsylvania		3
University of State of New York	1	
Universfty of South Tennessee		1
University of Tennessee		1
University of Texas		7
University of Virginia		1
University of Wisconsin		1
Vanderbilt University, Tennessee		1
Vassar College		2
Vienna, Verein Zum Schutze des östery, Weinbaues		1
Vilmorin, Audrieux & Cie., Paris		1
Virginia Agricult. and Mech. College		1
Wallis, A., Stockholm		1
Washington and Jefferson College		1
Washington Philosophical Society		1
Washington University, St. Louis		2
Webster, H. T., Oakland		1
Welcker, Adair, Sacramento		2
Welcker, Hon. W. T	1	
Westminster College, Pennsylvania		2
Williams, J. F., St. Paul		1
Wilkinson, Charles T.	1	
Winchell, Prof. N. H., Minnesota		1
Wisconsin State Historical Society		1
Woman's Medical College, Philadelphia		1
Women's Educational Club, W. Newton, Massachusetts	1	
Woodhams, M. S., Class of 1888, U. C.	1	
Woodman, Cyrus		1
Woolford, F. L., M. C.		1
Wooster University, Cleveland, Ohio		1
Worcester Society of Antiquity		1
Total	1,126	1,098

During the year the publishers of the following have kindly presented their issues to the Library: 1. Anderson Enterprise; 2. Berkeley Advocate; 3. Berkeley Herald; 4. California Democrat; 5. California Homœopath; 6. California Medical Journal; 7. California Teacher; 8. Congressional Record; 9. Contra Costa Gazette; 10. Los Angeles Daily Times; 11. Microscopical Bulletin; 12. Northwest Tribune; 13. Oakland Enquirer; 14. Oakland Evening Tribune; 15. Pacific Medical and Surgical Journal; 16. San Franciscan; 17. S. F. Daily Evening Bulletin; 18. San Francisco Daily Evening Report; 19. Sacramento Daily Bee; 20. Sacramento Daily Record-Union; 21. Sotheran's Publisher's Circular; 22. The Father's Love; 23. The Friend; 24. The Pacific; 25. The Voice; 26. U. S. Patent Office Gazette; 27. Occident (U. C.); 28. Berkeleyan.

The following, also, are regularly received: Annals and Transactions of N. Y. Academy of Sciences; Bolletino Biblioteca Nationale Centrale; Iowa State Historical Record; Proceedings American Philosophical Society; Rendiconti Accademia dei Lincei; Transactions of Technical Society of Pacific Coast.

APPENDIX II.

Books lost or missing during the Academic years 1884–5 and 1885–6:

1. Anderson. Pictorial History of the United States.
2. Bain. Composition and Rhetoric.
3. Balmes. Logica.
4. Bowser. Analytic Geometry.
5. Carlyle. Frederick the Great, v. I.
6. Creighton. Age of Elizabeth (Epoch series).
7. Elliot. History of Omega Chapter (Sigma Chi Fraternity).
8. Ganot. Physics, ed. by Atkinson.
9. Hadley. Greek Grammar, 1861.
10. Hamerling. Aspasia, v. II, (I returned June 22).
11. Homer. Odyssey, trans. by Lang and Leaf.
12. Huxley. Elementary Physiology, (1 copy).
13. Hutchings. Rules for Construction of Vessels, 35 pp. (Probably misplaced).
14. Juvenal, Persius translated (Harper's Library).
15. Juvenal, Persius Satiræ, with commentary by Macleane.
16. LeConte. Sight.
17. Maine. Early Law and Custom.
18. Olney. Geometry (University edition).
19. Plautus. Comedies, tr. by Riley, Vol. I.
20. Royce. Primer of Logical Analysis.
21. Salmon. Treatise on Conic Sections.
22. Saintsbury. Primer of French Literature.
23. Scott. History of Scotland, Vol. I.
24. Shakespeare. Harvard twenty volume edition, Vol. XII.
25. Sophocles. Plays, edited by Jebb, Vol. I.

NOTE.—Since the date of this report, Nos. 5, 8, 10, 11, 12, 16, 19, in Appendix II, have been returned and found. (Oct. 21, 1886.)

UNIVERSITY OF ILLINOIS-URBANA
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